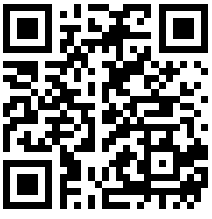

The Book of Knowledge

The Children's Encyclopædia

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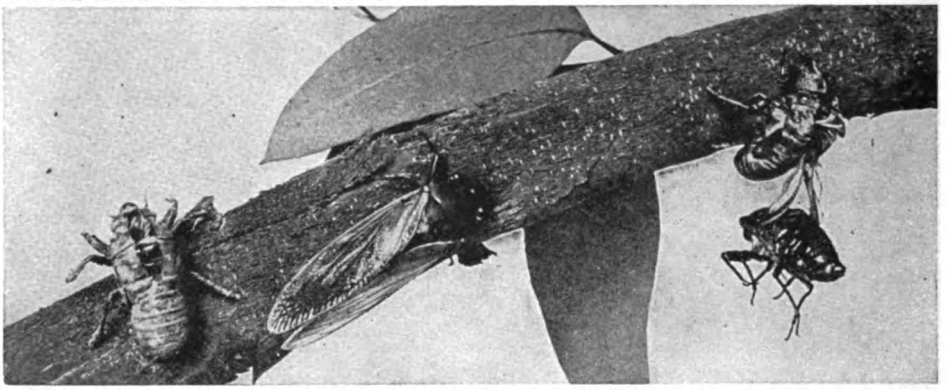
CONTENTS OF THIS VOLUME

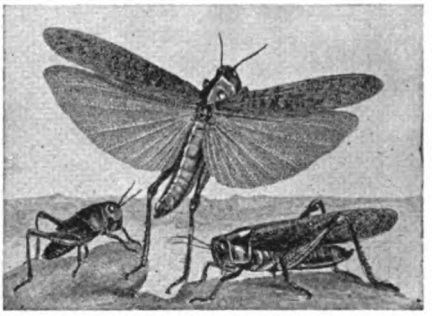
This is a short guide only to the principal contents of this volume. It is not possible to give the titles of all the Poems and Rhymes, Legends, Problems, colour pages, questions in the Wonder Book, and many other things that come into the volume; but in all cases are given the pages where these parts of our book begin. The full list of these things comes into the big index to the whole work.

THE DEADLY LOCUST AND HOW MEN FIGHT IT



This picture shows the Australian cicada, a near relative of the deadly "seventeen-year" locust of America. All these insects go through the same four stages as butterflies. First there is the egg, then the larva, then the chrysalis, and finally the fully developed winged creature. Here we see, on the left, a cicada with the chrysalis shell it has just left, and on the right another cicada leaving the shell, with only the tips of its wings attached.

There are ten different kinds of grasshoppers in Britain. The one shown here is found in the late summer.



Here are three views of the migratory locust of South-East Europe. On the left is the larva, on the right the fully developed locust, and in the middle the same creature in flight.

Here we see the common house cricket, which makes its chirping noise by rubbing its wing-sheaths together.

In those lands where the locust swarms, and works such ruin, the most elaborate and costly means have to be taken to destroy them. Locusts cannot climb up a smooth surface, and so while they are wingless, and thus unable to fly, smooth canvas screens are set up across the line of march of a swarm, and, at intervals, pits are dug at the foot of the screen. The locusts, unable to surmount the screen, fall into the pits, where they are killed.

A locust storm in South Africa, such as this, stretches hundreds of miles, and blots out the light for hours.

SOME INSECT FOES OF MAN

CONTINUED FROM 2993

FEW of us imagine how important a part in the history of the world little insects play. Next to the poisonous snakes, they are really more to be dreaded than any other form of animal life. There is nothing else living that does so much damage to property. A lion or a tiger is more terrible to face than a mosquito, but the innocent-looking mosquito may cause death as surely as the fearful man-eater. Animals are big and comparatively few; insects are little, but their numbers are by no means small, they are more than men can count, and the insects are not discovered until the damage is done.

How a plague of insects begins it is not always easy to say. But we know how one began, and we may get an idea from that as to what happens in other parts. Up to about forty years ago the gipsy moth was unknown in Massachusetts. But then an unfortunate thing happened. A French scientist was carrying on experiments in his laboratory with the window open, when a gust of wind carried out into the garden a few eggs of the gipsy moth, that had been sent to him at his home in Massachusetts by a friend.

Those few eggs were hatched and the caterpillars became moths which laid many more eggs. So terribly did they increase that within a few years the gipsy moths had spread over an area of 220 miles. Men tried in vain to fight against the plague. The caterpillars swarmed over the trees and ate them bare, as if a fire had swept over the land. Over 40,000,000 trees were raided again and again in this way. The Government of the state spent as much as $90,000 a year for thirty years in succession, but still the plague continues, and still Massachusetts is robbed of much wealth by this pest.

The Colorado beetle is another dreaded enemy of the farmer. It is rather a handsome little beetle, with its orange-coloured, black-spotted coat, but it completely ruins the potato crop wherever it gets a hold. Until recent times it existed only on wild crops, but then it got among the cultivated potatoes of Colorado. The mother beetle lays hundreds of eggs on the leaves of the potato plant. The young ones hatch very quickly and lay eggs in turn, and the young ones from these then lay eggs—all this in one summer. During the winter they go to sleep in the ground, but wake up in the spring, and attack the plants so that in some parts the potato crops are completely destroyed. Any person found with living specimens in his possession is heavily fined. This pest is dreaded in Great Britain.

We all know the cuckoo-spit, or froth-fly, or frog-hopper, or froth-hopper, or frog-spit—it has all these names in different parts of the country. It is the insect which lives on stems of grass and many other growths. There are many varieties of it. It sucks the juice of the plant or

growth upon which it lives, and forms a dwelling of froth, supposed by many people to be little bubbles blown by the cuckoo. If we remove the froth we find a surprising little animal inside, a yellowish-green insect with long hind legs, with which it can hop like a frog. A little girl discovered one of these insects by making the sun shine through a magnifying glass upon the froth. Out pounced the froth-fly, looking as surprised and angry as an insect can look.

Now, the frog-hopper serves to introduce us to one of his most dangerous relatives, the cicada, which, though known in Europe, is most deadly in America, where we name it the "seventeen-year" locust. This title is given it because it appears as a pest once every seventeen years. What happens is this: The male flies of the perfect cicada die soon after their wedding day; but the female fly lays about 500 eggs in the twigs of the tree upon which it settles, and then dies. But before it dies it inflicts terrible damage upon the tree. The eggs lie in the warmth and hatch, and the grubs, as soon as they are born, fall to the ground, and make their way into the soil. There they live for seventeen years, sucking the sap from the roots of plants, and doing great damage.

How millions of pounds are lost through the work of a little fly

At the end of their seventeen years underground they appear as flies, and then attack the foliage of the tree, completely ruining the fruit crop. Of course, some flies of this family appear every year, but it is only once every seventeen years that the multitudes come forth to work havoc. In 1874 the attack of these flies caused damage in four states in America amounting to $100,000,000, not to mention enormous damage through losses in trade dependent upon the crops which these insects had spoilt.

There is another cicada known as the thirteen-year locust, so called because it appears in swarms every thirteenth year. The cicada is a curiosity because of its loud and musical chirping. Some people, when there is not a plague of cicadas, keep the insects in cages for the sake of their chirping, which, when the air is still, can be heard a mile away. Whenever we think of damage done by insects, however, our thoughts always turn to the locust. That was the first destructive insect any of us read about, for its terrible ravages are described in the Bible. Well, the locust appears in just as great swarms to-day, and is every bit as much to be feared as it used to be in the old days.

Flying armies of locusts that sound like a rushing, mighty river

There are many species of locust, and its family includes our grasshoppers. Some locusts are only a quarter of an inch long; others are five inches in length. The female has a strong boring weapon, and with it she drills a hole in the ground, and there lays her eggs. When the young ones are hatched and grow strong, they have hearty appetites At first they have no wings. So they march in countless armies, in search of food.

They go straight forward, nothing turning them aside. Every green blade disappears as they go. If they are not stopped, they feed and feed, and presently their wings appear, and then they rise into the air and continue their progress by flying. Then it is that travellers see them in the vast hordes of which they tell us. The swarms blot out the light of the sun. They fill the heavens as with a black cloud, and the noise of their wings and the movements of their hungry jaws is compared to the rushing sound of a broad river. They alight from time to time, and suddenly, where a few minutes before there appeared a field of corn or a grove of trees, there remains nothing but a mass of stubble, or a forest of bare branches.

On and on they go, travelling to lands beyond the sea. They have been met in a cloud 500 feet high, 1,200 miles from land. Wherever they have passed over land they have left ruin and desolation.

A solid bank of locusts fifty miles long on the sea-shore

Sometimes a great wind will blow them into the sea. This happened towards the close of the eighteenth century, in South Africa, where 2,000 square miles of land had been covered by them. A great wind blew them into the sea, and so many were drowned that when their bodies were cast up by the waves they formed a bank four feet high and fifty miles in length. Nothing can save the farmer over whose fields or orchards a swarm of

SOME INSECTS IN THEIR NATURAL COLOURS

In no department of animal life do we find such myriad forms as in the insect world. It is estimated that there are over a million different kinds of insects, more than all other varieties of living creatures together. On this page we see a few insects, some of which have no English names.

A. Arm-chocked beetle
A1. Perforated tortoise beetle
B. Plant bug
B1. Lace-wing fly
C. Eyed leaf insect
C1. Tsetse fly
D. Giant wood wasp
D1. Death's-head moth
E. Irish burnet moth
E1. Lantern fly
F. Cockchafer
F1. Chrysochroa
G. Praying mantis
G1. Demoiselle dragon fly
H. Mole cricket
H1. Yellow longhorn beetle
I. Winged stick insect
I. Chinese tortoise beetle
J1. Australian longhorn beetle
K. Carabus ulevs
L. Golden lampyna
M. Scarlet tiger moth
N. Great green grasshopper
O. Countess beetle
P. Walking anthicus
Q. Rose-chafer
R. Great dragon fly
S. Greenbottle fly
T. Hornet
U. Ichneumon fly
V. Stag beetle
W. Humble bee
X. Cerocoma schefferi
Y. Great water beetle
Z. Serricornia sternicornis

The word insect means "cut into," and the name is given to these creatures because their body is so distinctly divided into three parts the head, chest, and abdomen. Insects have wonderful organs of sight and smell. The cockchafer, for example, has 39,000 separate organs of scent.

locusts flies. The only hope seems to be to grapple with them before they get their wings—when they are marching on foot. Until 1881 they used to scourge the island of Cyprus. Then two clever men went into the problem, and mastered the locusts. It was a wonderful thing that they did—wonderful because, though it was successful, it was so simple. It was solely the result of watching the ways of the locusts.

THOUSANDS OF MILLIONS OF LOCUSTS CAUGHT IN ONE YEAR ON ONE ISLAND

The young locusts always march in a straight line. What the men did, therefore, was to erect great screens of canvas, and at the top they put smooth oilcloth. Now, the locusts cannot climb over anything smooth. So here were the great screens of canvas with oilcloth at the top ready for them.

When the locusts appeared, they began to climb up the canvas, but on reaching the oilcloth they fell back off it, crawled along at the foot of the screen until they tumbled into deep pits, which had been dug every few yards at the side of the screens. The pits were lined with polished zinc, so that, once in, the locusts could not get out, even if the weight of thousands and thousands of others falling on top had not prevented them. The men used 500,000 yards of canvas and dug 26,000 pits, and the result was that in the first year they caught 214,000,000,000 locusts, and in the following year 56,000,000,000 locusts. It cost £27,000 to do the work, but as each two shillings spent meant a million locusts destroyed, they thought the money was well used. And so it was, for locusts have now vanished from Cyprus. But supposing that these measures had not been taken, there would soon have been enough locusts in Cyprus alone to destroy the crops of any country to which the descendants of these swarms had flown.

THE LITTLE CRICKET THAT BURROWS UNDERGROUND & RUINS OUR GARDENS

The nearest approach to locusts that we get in this country are the grasshoppers and crickets. But we must be sure to remember that we need find no fault with our grasshoppers and field crickets. As a rule, they do us no harm. There is one dangerous member of the family, the mole cricket. This one has great claws in front, by means of which he bores a shaft, and from the bottom of it digs tunnels in all directions, like the mole. As he works straight through the roots that lie in his way, he may do a good deal of damage to the garden. The rest are harmless in the fields. Indeed, it is a question whether they are not of benefit to us, as they eat so many caterpillars and other harmful insects.

There is a striking difference between the grasshopper and the locust. The locust has its ears under its stomach, while the ears of the grasshopper are placed at the sides of its two front legs. The locust makes its loud chirp by rubbing its rough spiny wings one against another; so do the grasshoppers and crickets. Only the males do this, however, for the females have no means of making this noise. The noise that these male insects make is their way of calling their mates to them, and the female gives the best reply by going herself to answer it. The house cricket cannot be regarded as a friend of man. It is a burglar which gets into our houses, tunnels its way into the side of the fireplace, and comes out at night to steal.

THE HOUSE CRICKET THAT LEAPS AND FLIES, AND GNAWS DAMP CLOTHES

Like the grasshoppers, crickets are great leapers. With their powerful jaws they can do a good deal of damage. They will gnaw holes in damp clothes placed before the fire to dry at nights. This they do for the sake of the moisture in the garments. One cricket jumped right into a cup of tea which was being drunk by a lady to whom the writer of this story was talking. Crickets can fly as well as jump, but as they only come out at night, and are anxious to get back to their holes the minute a light is turned on, we do not often see them flying.

It is evident to most of us that crickets and grasshoppers and locusts belong to the same order, but who would think that cockroaches are of the same family? They are, and so are earwigs, though these are a division by themselves. The cockroach is that big, fat, nasty insect which many of us call the black-beetle. It is not a beetle, but is a member of the winged order called Orthoptera. It has, like the cricket, two pairs of wings, the outer ones of a horny character, and acting rather as a shield for the others than for the purpose of flight. The under pair, however, are excellent wings, though the cockroach runs so fast

with his six splendid legs that he rarely has need to fly. The cockroach came to us in ships carrying cargo from the hot lands of Asia, and is comparatively a new resident with us. It is one of the most hateful things we have. It crawls all over any food that it can reach, and there issues from its mouth so foul a fluid that it spoils everything it touches. It is a confirmed cannibal.

THE STRONG JAWS OF THE EARWIG THAT BITE AND SPOIL OUR FLOWERS

In England it is matched by the earwig. Some naturalists say that the earwig will not readily eat the flesh of its kind, but that is not the case. If an earwig be killed at night where many earwigs assemble, in a few minutes the dead body will be surrounded by half a dozen other earwigs, all eating away as if there were nothing else in the world for them. The earwig does not come so much into our houses as the cockroach does; it is usually to be found among our flowers. Dahlias are its special favourites, though nasturtiums will always attract it. Its sharp jaws enable it to bite pieces out of our finest blooms, while the insect may generally be looked for in any pear or apple which a bird or wasp has attacked.

The mother cockroach lays her eggs in the most beautiful little horny case, sixteen eggs to the case; but after that she cares no more, and leaves the little ones entirely to themselves. The mother earwig is a really affectionate parent, and "mothers" her little ones like a hen or an old lady lobster. We must all have noticed how quickly an earwig drops to the ground if it is alarmed, or if it wishes to get quickly to the floor from the ceiling on which it is resting.

THE EARWIG'S BEAUTIFUL WINGS THAT WE VERY RARELY SEE

There is no reason why it should fall, except that it knows that its horny covering makes it safe to do so. It has the most beautiful wings folded away under the wing-covers on its back. It is quite a big task to get them unfolded and then folded back again in their proper position. There are thousands of earwigs in the ivy covering an English house known to this writer; but though swarms of earwigs, which come in through the open windows on summer nights, attracted by the light, have been examined, only one was seen to unfold its wings. The wings are not shaped like those of the cricket and grasshopper, but are more fan-shaped. The pincers, or forceps, which the earwig carries help it to fold up the wings again. But those forceps can nip too. One may have handled many earwigs without result, until it seems as if the stories as to their nipping were not true; but one day an earwig got on the present writer's forehead, and without any provocation gave him a nip which he will not soon forget.

As we have read on another page, the story about earwigs getting into our ears is all nonsense; and that brings us to another absurd fable which terrifies very many people. Men and women who are otherwise well educated are so foolish as to believe if they hear a certain ticking in the woodwork of their houses, or their furniture, that it is a warning meant to tell them that a death is about to occur in their houses. An instant's serious thought should show how impossible the thing is; but as they cannot see what causes the sound they hear, and as people have for ages and ages believed the same thing, people go on believing the story to-day.

THE STRANGE TICKING SOUND OF A LITTLE BROWN BEETLE

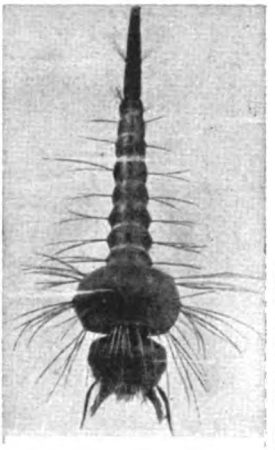
What is this fearful "death-tick" or "death-watch"? It is a sound made by a little wood-boring insect with a stupidly long name—the Xestobium tessellatum. It is simply a rather fat red-brown beetle which bores its way into the woodwork of our furniture, tunnels through and through it, eating the wood which it bores, and ruining the furniture just as fast as it can. It has a thick, horny head, and the so-called death-tick is the result of the beetle's calling to its mate, as the cricket calls to his.

But instead of rubbing legs or wings, the beetle bangs his silly little head on the wooden floor of his tunnel, and that is the way he signals to his sweetheart. Generally he knocks four or five times, then is still. Men have kept these insects at various times, and tried to make them utter their signal in the open, but without success, until one man chanced to knock gently with a pencil near the box in which the beetle was. Instantly the beetle thumped away with his head. And if we capture one of them and gently tap four or

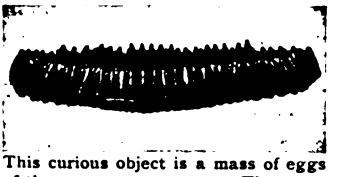
THE MOSQUITO, THE GNAT, AND THE MIDGE

Mosquitoes are found from the Arctic Circle to the Equator. Here we see the larva of the spotted mosquito, which floats on water, but dives when alarmed.

The chrysalis of our common grey gnat, shown here, first lives in the ground, but later swims on the water, where the skin splits and the gnat at once emerges.



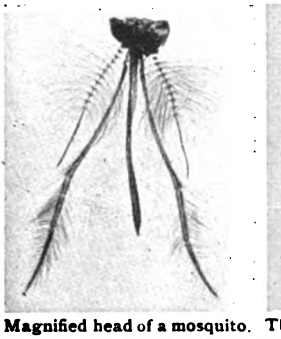
The larva of the common grey gnat usually rests at the surface of the water, but if alarmed it goes suddenly under.



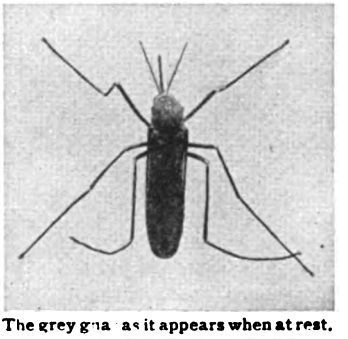
This curious object is a mass of eggs of the common grey gnat. There are as many as 375 eggs, and they float together on the water like a raft.

The chrysalis of the spotted mosquito rests on water, but can swim rapidly by jerking its abdomen, which is provided with two paddle-like organs.

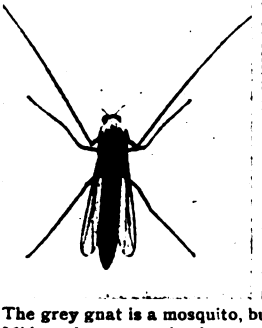
The female of the common grey gnat.

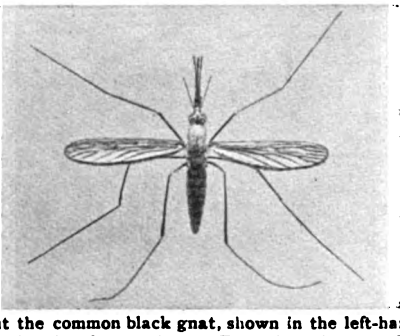


Magnified head of a mosquito.

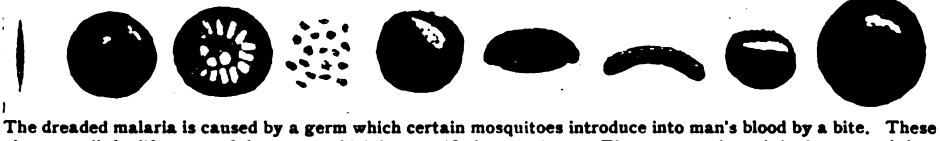


The grey gnat as it appears when at rest.





The grey gnat is a mosquito, but the common black gnat, shown in the left-hand picture, is one of the midges. Midges have not the large proboscis of mosquitoes. The other pictures show female spotted mosquitoes



The dreaded malaria is caused by a germ which certain mosquitoes introduce into man's blood by a bite. These pictures tell the life-story of the germ, which is magnified 5,000 times. First we see the original germ and then the same germ in the blood. Next it divides up into spores, or seeds, which become loose, as in picture 4, and grow crescent-shaped, as in the next picture. So far they are harmless, but if the mosquito bites a man the germs return to the insect and change, as in the last three pictures. If reintroduced into human blood, they cause malaria.

five times so that the beetle may hear, we can have as many "death-warnings" as we like, whenever the beetle is not asleep or too busy feeding.

The beetle that we have been discussing now is one of a family of insects which make their way into woodwork. They are as great a nuisance on land as the wood-boring worms are in the water. All the holes that we see in what we call worm-eaten wood are caused by these little pests and their young ones.

THE COMMON FLY THAT SPOILS THE MILK AND SPREADS DISEASE INDOORS

We need not leave the house to discover one of the greatest of pests, the fly. The only thing that can be said in favour of flies is that they are good scavengers out of doors, eating up all sorts of horrible refuse which would otherwise make the atmosphere foul. But in civilised countries we ought not to have to depend upon methods of scavenging such as prevail among savages. Flies carry disease to our food. When they are most abundant, in the latter part of the summer, they poison milk and other food which little children take, and cause many, many deaths. Indeed, the wise men of one big town in the North of England, where there are many poor people, came to this conclusion—that it would be cheaper for the town council to provide, at their own cost, pure milk which flies had not corrupted, than to bear the cost of all the funerals of little pauper children whose deaths had been caused by dirty habits of the flies.

Nothing is too bad for a fly to eat. It settles upon poisonous refuse, then flies off with parts of the poison adhering to it into a house, and there settles down on foodstuffs, on sugar, into milk, and so forth, and leaves corruption wherever it goes. The eggs of the common house-fly are laid in unhealthy refuse, where the grubs hatch and feed.

LITTLE FLIES THAT ARE OLD AND BIG FLIES THAT ARE YOUNG

Then they pass into a chrysalis stage, and eventually issue as perfect, full-grown flies. When we see flies of different sizes, we must not imagine that one is a young fly and another an old one They are all fully grown when they leave the chrysalis. We have two or three sorts in our houses. One of them, the one which we fancy bites, and does really bite, bites us to suck our blood. It is called the stomoxys, and is a small black fly, that does not appear until the autumn. The flies which we see hanging swollen and dead about the house have been killed by a fungus which attaches to them. This fungus eats its way into the body of the fly and kills it, and then spores drift off to become attached to other flies.

The bluebottle, which we almost forgive for its bright coat and breezy hum, is a filthy enemy of the larder. It deposits its eggs upon flesh, or in wounds of animals, and there the eggs hatch and the larvæ feed where they are.

We cannot stay to examine all the flies, for they are vastly numerous. We must, however, not overlook the dreaded tsetse fly. This, though it may bite man, does not cause him any serious harm, but its bite is certain death to horses, oxen, and dogs. It lives in certain districts in Africa, and is supposed not to stray beyond them. It is noticed, however, that if anything occurs to disturb the wild animals and to send them afield beyond the places which they ordinarily inhabit, there the tsetse fly is also discovered. It has been suggested that all wild animals near human habitations should be killed so that the dreaded fly may be destroyed.

BRAVE MEN WHO HAVE DIED TO SAVE US FROM PLAGUES CARRIED BY FLIES

As might be expected, there are innumerable varieties of flies in lands where we have heat and moisture prevailing in forest and swamp. South America and many parts of Africa are rendered almost unbearable by flies that sting and bite, while large areas in Italy—to name only one part of Europe—are the seat of disease and death every summer, as the result of winged plagues in undrained lands.

There is still much to be learned about poisonous insects, and many men are bravely devoting themselves to the work. Many men have sacrificed their lives while studying the problems. They have gone into lands infested with deadly insects, and allowed themselves to be bitten so that they might trace the manner in which the disease begins, the insects from which it comes, and the manner of dealing with it. The story of these men is very sad but very wonderful. They are as brave as

the bravest soldier that ever fought on a battlefield, for they fight, not to kill men, but to save them, and they lay down their own lives to save those of millions of people who may never hear of them or of the sacrifice they make. Naturally, where there is so much to be learned, the way to knowledge is hard and difficult to discover.

THE DOCTOR WHO LIVED IN A SWAMP TO STUDY A FLY

One of the worst diseases which afflict men who go to the unhealthy parts of Africa is called sleeping sickness. When bitten by the insect which carries the particular sort of poison causing this disease, men become overpowered with a desire to sleep; all their energy and will-power go from them, and they die. A great doctor named Professor Koch has been studying the problem. For eighteen months he lived by himself in the swampy regions round Lake Victoria Nyanza, in Africa, where poisonous insects teem in countless swarms. He believes that the disease is caused by the bite of an insect named the Glossina palpalis. This insect, he finds, breeds along the banks of the lakes and streams. It can be found from the source of a stream right down its banks running through hundreds of miles of country, spreading this terrible disease wherever it goes.

His experiments led him to a curious theory. He found that wherever there are crocodiles there also we find the insect which causes sleeping sickness. The insects, he says, live upon the crocodile in the first instance. They would seem to have a poor chance of biting these horny monsters. But they suck the blood between the armour plates of the crocodile's hide. When a man draws near they fly off to him to suck his blood, and in so doing they inject poison into his system which in the end causes his death.

A MOSQUITO PLAGUE THAT WOULD EMPTY LONDON IN A YEAR

Professor Koch says that we ought to kill all the crocodiles, so that, their chief food being destroyed, the deadly insects must to a great extent die out.

One of the deadliest foes of man in tropical lands is the mosquito. We say in a general way that we have no mosquitoes in our country, "only gnats and midges," we say. But we are wrong in so saying. We *have* mosquitoes here, and they are in some years so numerous as to make it almost impossible for men to work in the fields. Their bite causes death even here, though, happily, that rarely happens. But in India men, women, and children used to die from a terrible illness which we call malaria, at the rate of 5,000,000 a year. Deaths at that rate in New York would leave not a soul alive in that capital in little more than a year. There were places in Africa where the death-rate from malarial fever was so terrible that these places were called "the white man's grave." All sorts of beliefs as to the cause of these plagues were entertained. Many people thought that they resulted from poisonous fumes arising from the ground. But brave men like those of whom we have been reading risked their lives to solve the problem, and they found out what it all means.

They knew that death resulted when a man had been bitten by mosquitoes, but they could not for a long time discover which was the deadly mosquito that actually caused the tragedy.

AN INSECT THAT RIDES ON THE MOSQUITO AND CARRIES DEATH TO MEN

Among the men who studied the question in India was a brave young officer named Major Ronald Ross. He studied all the different varieties of mosquitoes that he could discover. He took samples of the blood of men who had been bitten, and found in them a tiny organism which evidently conveyed the poison that caused death. But how did the organism get into men's blood? What had that to do with mosquitoes?

After months and months of study he found that all the while he had been on the wrong track. The mosquito that he was seeking slept while he was awake, and came out to work its mischief while he was in bed. It is a night-flying mosquito. As soon as he discovered this, and examined the mosquito, he was rewarded for all his labours in examining other mosquitoes, for here was one different from the rest. Upon its body he noticed a little parasite. A parasite is, as we know, a small animal living upon the body of larger animals. This parasite was the origin of the poison. Like the ichneumon fly, it lays its eggs in the body of the mosquito. These lodge in the poison

gland of the mosquito. When the mosquito bites a man, these eggs are forced into the wound caused by the bite, and there they develop and poison the man and cause his death.

It would be of little use to find the cause of death unless we were able also to find a remedy. Now, the life-history of mosquitoes, gnats, and midges is very similar. The full-grown insects lay their eggs either in water, or in damp, decaying vegetation, or behind the bark of fallen trees. There they hatch and come forth as full-grown insects, ready to carry on the work of destruction.

Now, in many countries, there is very little attempt at proper drainage. Stagnant pools lie about in the streets; rubbish collects in the villages; dirty old tins and cans lie about with water in them; water-butts are uncovered; there are a thousand places in which the deadly insects can be reared. Therefore, it became evident that if men, women, and children were to save their lives from the attacks of the insects, they must be clean in their habits.

DEADLY INSECTS THAT COMPEL US TO OBEY THE LAWS OF HEALTH

They must allow no pools of water to collect in their streets; they must allow no swamps to remain undrained near their cities; they must have no water-tanks open, or if they were open, then petroleum must be poured into the water to kill the insects there.

These horrid little insects, for whose existence it seemed impossible to find any excuse, might seem to have been sent by Nature to teach men to be clean. Towns which had been hot-beds of disease became absolutely healthy when the new rules were enforced. Death had been frightfully prevalent among the men who are building the Panama Canal, because of the bites of mosquitoes. The American Government sent skilful, determined men to carry out the work of making men clean and careful.

The stagnant pools were dried up; all rubbish was burnt; no place was left in which the mosquitoes could lay their eggs. And the result was that yellow fever and malaria, which the mosquitoes had previously caused, all disappeared. The same thing can be done for the health of people in the deadliest climates. If they will only attend to the laws of health, they need not fall victims; if they neglect them, then they fall victims to the insects which carry certain death. The same law applies to horrible parasites which afflict human beings at home.

HOW NATURE USES TINY INSECTS TO PUNISH CARELESS FOLK

Many unpleasant things, which we need not discuss, live upon the bodies of human beings if human beings are not careful. There is a parasite for everything. Animals have theirs, poultry and birds have theirs, and man has his. Man, with his superior sense, can avoid them if he will. All that he has to do is to keep himself perfectly clean, and he will escape, or, if he is temporarily attacked, then he must take the proper course to rid himself at once, and all will be well. If he will but keep himself clean, he can keep himself free; if he does not, then he must pay the penalty. Nature has no mercy for the careless and unclean.

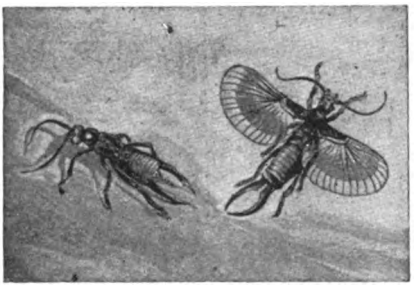
Our mosquitoes and midges in the Northern States are not very deadly. We have several species of mosquitoes, of which some bite. A gnat is a mosquito and a mosquito is, of course, a gnat. Those that have feathery, plume-like antennæ are harmless. These are the males, which live upon vegetable substances. Those that have not the plume, but sit, when at rest, with the hind legs upturned, are the females, and the ones that bite.

It is the female midge, too, which bites, not the male. Midges are smaller than the gnat, and, when examined under the microscope, are really beautiful little things to look at. But they are better dead than alive, for their bite is most painful. Like the mosquito and other blood-sucking insects, they have the most wonderful tools for their work.

THE LITTLE MIDGE WITH A LANCE FOR CUTTING AND A PUMP FOR SUCKING

They have barbed lances for cutting and sawing, and little pumps with which to suck up the blood. How it is that they cause such pain is not quite clear. Some men think that they squirt into the wound that they cause a little drop of poison to make the blood thinner and more ready to flow. The fact is, however, that, except in a year of many midges, we think so little of them that we do not bother to examine their ways. They affect people very differently.

The common cockroach of our kitchens comes from the Far East. It has wings, is distinct from the black-beetle, and is, in fact, not a beetle at all.



In the whole insect world there is no creature that has such large and gauzy wings folded into so small a space as the earwig. Here we see the large earwig with its wings closed up, and on the right the common earwig with wings extended.

The common bluebottle, or blowfly, has an amazing keenness of sense, probably of smell, which enables it to discover flesh at great distances.

Upon some they make merely a red spot; upon others they raise huge lumps, so big that, if the bite be upon the face, the whole eye may be closed up until the effects of the bite disappear.

We ought to feel very thankful that the horse-flies do not often attack us. They are the great grey-bodied wretches which hum so loudly as they fly. They do not often bite men, but when they do they show the most alarming intelligence. They settle upon the back or shoulders, so that they may bite and not be immediately perceived, and so powerful are their tools that they can pierce thick clothing, and so reach the flesh beneath. Horses they attack by settling where the animals will be least likely to reach them with their tails.

There are other enemies of men which do not fly, and one of the commonest is the harvest mite. It is a little villain like a tiny copy of the red spider, whose attacks upon greenhouse growths the gardeners so much dread. This horrid insect reaches full growth in harvest time, and as we make our way through the fields, climbs upon us and crawls about our bodies until it can make its way into the flesh. It is almost impossible to see a harvest mite at the best of times, but once it has had a few minutes' start, to find it is impossible, for it tunnels into our flesh, and though it causes the most irritating smarting, we cannot reach it except by practically digging it out. The best thing to do is to rub the spot with ammonia.

The list of insect enemies is far from exhausted. There is a terrible array of them in the garden. We cannot deal with those here, but we must leave them for a story devoted entirely to the garden, with some pictures of the creatures actually at work. Those that we have been thinking of now, however, suffice to show us how very careful men have to be to guard their health and property from the lesser animals of the world. It is because they multiply with such terrible speed that the harmful insects do us so much damage. In the story that begins on page 3255, we see how the friendly insects help man to check the ravages of these insect enemies.

The next story of Nature is on page 3255.

The dreaded tsetse fly of Africa is little larger than our house-fly, and, although harmless to men and wild beasts, its bite is fatal to all domestic animals.

The death-watch is a beetle that seldom shows itself, but its curious ticking sound is feared by the superstitious, and it works havoc in our furniture and the floors and beams of our houses by riddling the wood with the tiny holes which it bores.

The great horse-fly sucks the blood of our horses and cattle, and in India even the elephant's thick skin does not protect him from the horse-fly.

The photographs on these pages are by Gordon W. Pepper, Frank P. Smith, Percy Collins, and others.

TURKEY AND THE BALKAN STATES

This map shows a part of the world that has been well described as "the cockpit of Europe," for right down the ages it has been, like the pits where game-cocks used to fight their battles, a constant scene of dispute and warfare. The mountainous character of the country, and its position as the meeting-place of races and civilisations, the link between the East and West, have all helped to make the Balkans the storm-centre of Europe.

The top picture on page 3151 is by E. Armitage, R.A., and hangs in the Walker Art Gallery, Liverpool, and the picture of the Empress Theodora on page 3153 is by Val Prinsep, R.A., and is reproduced here by permission of Mrs. Sholto Vere Hare, the owner.

No more magnificent site was ever selected for a city than that upon which Constantinople stands. Here we are looking from the city across the Golden Horn, the crescent-shaped arm of the Bosphorus

THE BALKAN PENINSULA

THE RISE AND DECLINE OF TURKEY

CONTINUED FROM 3024

MOHAMMED II

THE Balkan Peninsula is washed by four seas. There is the Adriatic, the Archipelago, the sea of many islands, the Sea of Marmora, and the Black Sea. Two narrow straits, called the Dardanelles and the Bosphorus, connect the Sea of Marmora with the Sea of Many Islands and the Black Sea.

Most of this long coast-line, like that of Italy, is very beautiful; so are the "many islands" that surround it. We find the same deliciously warm, sunny climate, the same lovely bays with white or yellow sands, the same green hills or bare rocks running down to the intensely blue sea, the same exquisite veil of shining haze, fit robe for a country whose early legends and history are the most mysteriously beautiful and wonderful in the world.

But in the Balkan Peninsula we have no story, as we had in Italy, of various separate states gradually fusing into one nation and kingdom. The relief of the peninsula will partly show us why. Rugged highlands cover much of its surface, the chief ranges being the sheltering Balkans, which give their name to the peninsula, and stretch across it, south of the Danube, east and west. The height of these mountains varies from 2,000 to 8,000 feet. The highest are, therefore, above our own Alleghenies. Many other ranges branch off in different directions; the Pindus chain, striking southward, forms a sort of backbone in the narrower part of the peninsula. There are several large plains, the chief being the great plain of the Lower Danube. South of the Balkans is the plain drained by the Maritza river; and the plain of Thessaly lies east of the Pindus range. These, and many smaller plains, are much isolated and cut off from each other by the far-reaching mountains, across which it has been very difficult to make good roads.

Another chief reason why the different states which were gradually formed in these plains and on the hillsides have never really united is that the peoples who have settled and ruled in them belong to quite different races, with different speech, and, to some extent, different religion.

Twice in the centuries since the birth of Christ there has been a ruling power in the peninsula strong enough to keep for a time the various states more or less under its control and leadership. But an unconquerable desire for independence has led to grim and tragic warfare all through the years. Consequently, as we look at the map of this part of Europe as it

is to-day, we have to remember that every mile of the wavy border lines that part the various countries in it have been fought for, lost and regained, often amid scenes of incredible cruelty. It is felt that some of those lines are even to-day not permanent.

GREECE, A FAMOUS LAND SHAPED LIKE A MULBERRY LEAF

Let us start at the southern end of the peninsula, the Morea, shaped like a mulberry leaf, the stalk that joins it to the mainland being the Isthmus of Corinth, which is now cut by a canal. The Morea, with the provinces to the north of it and many fairy-like islands, make up the far-famed country of Greece. We read of its heroes and its legends, its marvels and earliest history, in another part of our book; they all belong to its period of greatest glory in the times before the birth of Christ. This small country, especially the division of it called Attica, half the size of Long Island, with its famous city, Athens, has influenced the lives and thoughts of countless people for more than two thousand years, so great were the learning and the taste of those who lived and worked in it in the very far past.

We will take up its story when these most brilliant days were past, when it had been conquered, with other Greek-speaking provinces round the Sea of Many Islands, by the masterful Romans.

In the middle of the fourth century, Constantine, the Christian emperor, took the old Greek city of Byzantium, situated on the point where the rushing stream of the Bosphorus widens into the Sea of Marmora. A fine situation, thought the emperor: Asia in sight across the straits, a splendid harbour—the Golden Horn, we call it now—running seven miles inland.

HOW CONSTANTINE BUILT THE NEW ROME IN FULL SIGHT OF ASIA

And so he added to the city, built walls to defend it, and called it New Rome. But the name it has always borne is Constantinople—the city of Constantine—and it soon became the capital of the Eastern or Greek Empire, also called the Byzantine Empire. We see in the story of Italy how the great Roman Empire became weak, and how it split into two divisions, East and West, at the end of the fourth century.

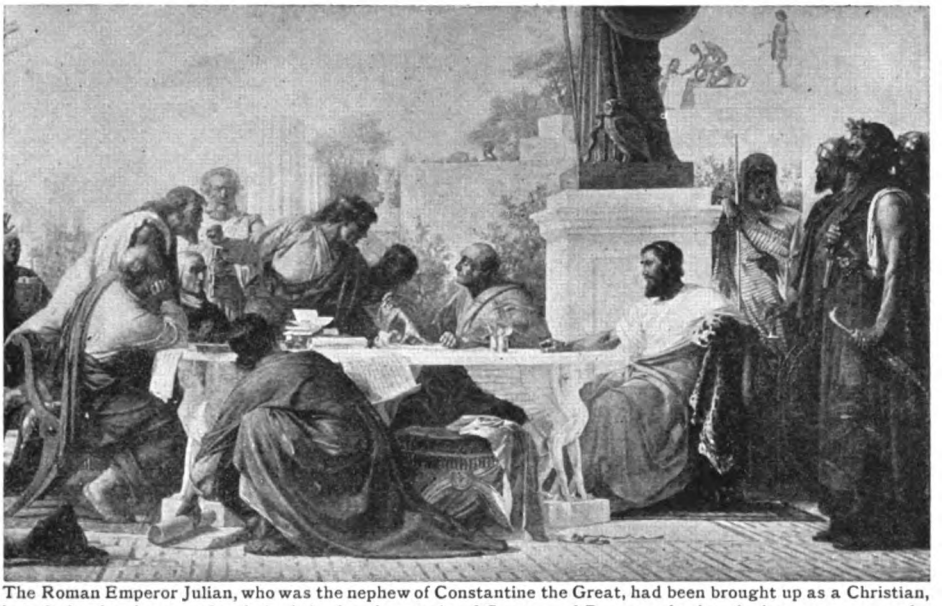
Unhappily, differences arose between the Churches of the East and West, and so it came to pass that as Christianity spread over Europe in the centuries when the formerly wild peoples were settling down, these peoples joined either the Western Church, with the Pope as head, or the Eastern Church, ruled by the Patriarch of Constantinople. We have seen already that the English, French, Germans, were converted by missionaries from Rome. But the Slavonic peoples, and others of different stock who became very much mixed up with the Slavs, settling, as they did, about the Balkans and the Danube from the sixth century onwards, had most to do with the Eastern Empire, and so took their Christianity from the Eastern or Greek Church. Chief among these peoples were some whose names appear on our modern maps—the Bulgars, who settled between the Danube and the Balkans, and whose kingdom now reaches over the southern slopes of the mountains; and the Serbs, who settled to the west of them, in Servia, and other smaller states near the Adriatic. Many and sore were the struggles between the Eastern emperors and these settlers on the northern boundaries of their dominions.

THE PEOPLE OF THE MOUNTAINS AND THE BUILDERS UP OF KINGDOMS

Let us look a little closer at the land on these northern boundaries. Then, as now, the noble Danube in its middle course rolled on full of water from the distant Alps and Carpathians, forming a splendid waterway from the plain of Hungary to the Black Sea. Then, as now, well-watered, fertile plains lay on each side of the river, shut in by the Hungarian mountains on the north and the Balkans in the south. The northern plain, with its sheltering slopes, became settled by tribes whose lands later became independent kingdoms, called Moldavia and Wallachia.

In the picturesque mountain country between the Black Sea and the Adriatic, a perfect ferment of peoples settled and fought and struggled with each other and with their neighbours, into whose hands they fell ever and again as the years rolled on. The kingdoms of the Bulgarians and Servians were particularly large and important, and towns and monasteries rose up among the mountains in the sunny valleys. Bosnia,

THE TRIUMPH OF PAGANISM IN THE EAST



The Roman Emperor Julian, who was the nephew of Constantine the Great, had been brought up as a Christian, but all the time he secretly admired the heathen gods of Greece and Rome, and when he became emperor he tried to restore the pagan worship. Because of this, he has been known in history as Julian the Apostate. He tried hard to win the Christians over to paganism by flattery and favour, and here we see him addressing a conference of Christians. It is said that on his death-bed Julian exclaimed, "Thou has conquered, O Galilean!"

The wonderful mosque of St. Sophia, at Constantinople, of which we see the interior in this picture, was built originally as a Christian church, by the Emperor Justinian the Great, and it has always been the world's finest example of Byzantine architecture. When the Turks took Constantinople they turned it into a mosque, and so what had once been the most beautiful Christian church became the most magnificent sanctuary of the Moslem world. Round the walls may be seen large circular plaques bearing texts from the Koran.

too, managed to keep itself distinct, and to develop into a kingdom.

About the middle of the sixth century the names of three great men stand out—the heroic General Belisarius, the Emperor Justinian the Great, and the writer Procopius, who gives such a full account of their doings. Two great deeds of Justinian's were the revision of the old Roman law and the building of the noble cathedral of St. Sophia at Constantinople. By bringing the stern old laws of the empire more into harmony with the gentler religion of Christ, Justinian did much good for his own times; but not only that, so well and thoroughly was the work done that this revision of his has ever since been of the greatest value to those who are starting the study of law. With regard to his other chief work, twice had the cathedral of St. Sophia been burned down.

THE BUILDING OF THE WONDERFUL CHURCH OF ST. SOPHIA 1,400 YEARS AGO

Within forty days of the second disaster, Justinian started the re-building of the magnificent place of worship we can see to-day. Its shape is that of a Greek cross—the four arms of equal length—with a vast dome in the centre. Procopius speaks of the glorious colours of the marble pillars—taken from the old temples of Asia—green and purple, glowing red and glittering white; the bright sunshine from the many windows of the dome falling on beautiful mosaics and gorgeous gilding, and on a wealth of gold and silver plate and precious gems. Such was St. Sophia 1,400 years ago.

About half a century after Justinian, the Emperor Heraclius fought many campaigns against the Persians, far away on the banks of the Euphrates, in Asia; and the cause of the war was this: In Jerusalem—the city so sacred to Christians, and at that time part of the emperor's dominions—there was treasured up a piece of wood, believed to be part of the Cross. The Persians, who had long been encroaching on the emperor's borders, came and took this piece of holy wood away. Heraclius, after much fighting, succeeded in getting it back from the Persians, and, returning to Constantinople, he laid it before the altar of St. Sophia, before restoring it to its shrine in Jerusalem.

About fifty years before the Persian war a strong man, belonging to an Arab tribe, was born at Mecca, and brought up by his uncle. He was a reformer, for he taught the Arabs, or Saracens, to give up idolatry, and to form themselves into one nation.

MOHAMMED'S LETTER TO THE KINGS OF THE EARTH, & THE PERSIAN KING'S REPLY

His new religion taught that there is but one God; that both the Jewish and Christian religions had come from God, but that he, Mohammed, was sent to teach a more perfect faith still, and to force it upon the whole world. Mohammed sent a sort of circular letter to the kings of the earth calling upon them to embrace this faith. The Persian king answered that he would put the prophet in chains when he had time; Heraclius made no direct reply, but sent some small presents.

It is almost impossible for us to realise the force and fury with which the followers of Mohammed, catching the fire of his tremendous enthusiasm, set forth to conquer the world to their faith by the sword. They not only did not fear death, but wanted to be killed if only they had slain an "unbeliever" first. For they firmly believed they would then be safe and sure of perfect happiness in the world to come.

It was this fierce spirit in the Saracens—for so they were called as they spread, conquering, far and near—that caused them to be so greatly dreaded. Province after province in Asia fell to them, including Jerusalem, and the holy wood was hastily taken back to St. Sophia. The magnificent walls of Constantinople saved it for another three centuries, but nearly all the time the emperors of the East were engaged in fighting the followers of the prophet.

THE TWO BRANCHES OF THE CHRISTIAN CHURCH BREAK APART

During these years the two branches of the Christian Church were ever drifting wider apart. Latin ceased to be a common tongue, and the Roman element became less and less strong. The Greek language and literature were more widely cultivated, and many scholars were at work in monasteries and schools, often in remote spots out of the way of the turmoil of incessant war. For, besides the struggle with the Mohammedan Saracens and

SOME FAMOUS RULERS OF BYZANTIUM

Belisarius, the Byzantine general, died in poverty. Legend says that, being blinded, he wandered about with a youth for guide, and the youth being killed by a snake, Belisarius carried the body, not realising he was dead.

The emperor under whom Belisarius served was Justinian the Great, who married a performer named Theodora. Theodora was very beautiful, but although wise and courageous, she was also arrogant and cruel.

Desiring a wife, the Emperor is said to have called the most beautiful maidens to his palace, and with a golden apple to give to the lady of his choice, he selected Casia, but by a pert reply to a remark of the emperor she offended him, and passing on he selected Theodora for empress, giving her the apple.

Turks, who followed them, the empire was beset with wild tribes pressing in from the north. Such were the Russians, who united in a single horde about the middle of the ninth century, and worked their way to the Black Sea. They made raids on the Bosphorus, and ravaged Bulgaria.

To make matters worse, there were a great many feeble and wicked emperors, stone-blind to the pressing needs of their times, who allowed their great inheritance to slip out of their weak and idle hands. Occasionally a strong man arose, such as Basil II., in the same century that saw the Norman conquest of England. Basil managed to subdue a strong compact against him formed by Bulgaria and Servia inland, and Macedonia by the sea. His cruelty was horrible, and gained him the name of the "Slayer of the Bulgarians." He moved back the border of the empire to the Danube; but his successors were weak and unworthy, and quite unable to resist the onward rush of the Seljouk Turks from the East, who, having become Mohammedans, gained Asia Minor and Jerusalem.

THE DESTRUCTION OF CONSTANTINOPLE AND THE SCATTERING OF ITS TREASURES

To this day pilgrims make their way, often on foot, from all the countries round, to visit the sacred shrines in the Holy City, and it was the tales of the bad treatment of the pilgrims long ago that roused Europe to start the Crusades.

The Fourth Crusade, headed by Baldwin of Flanders, fell very far short of the high aims with which these "Holy Wars" began. Detained for a while at Venice while waiting for ships to carry them eastwards, the Crusaders were persuaded to take up the private quarrels of the Venetians, and in the end they helped them to besiege Constantinople. The city was taken on the second attack, and the inhabitants were treated with terrible cruelty; their beautiful city was sacked, and the art treasures that Constantine and his successors had gathered together were ruined. To make paltry coins, the most beautiful bronze statues the world has ever seen were cast into the melting-pot. So "Christians" of the West treated Constantinople of the East.

Baldwin was elected emperor; but his rule was not for long. The Venetians and the Genoese, bent on enriching themselves by trade, shared various islands and ports between them. The large island of Crete, with its steep mountains dark with evergreen foliage and its smiling valleys, fell for a time to Venice.

During the last century of the existence of the once mighty but now dying empire, its great destroyers, the Ottoman Turks, or Osmanli, under their crescent banner, were gradually carving their way to the heart of the empire, Constantinople. The Asiatic provinces, the chief islands and ports, fell one by one, and still on they came.

THE MARCH OF THE TURKS INTO EUROPE, AND THE DOOM OF THE QUARRELLERS

The story of how the Turkish Crown Prince with eighty followers crossed into Europe on rafts is most thrilling. At the narrowest part of the Dardanelles —no wider than a good-sized river— they succeeded in gaining a fort, the first foothold of the Ottoman Turks in Europe. Before many years had passed, towns, villages, valleys, all fell to the conquerors—even Adrianople, the second city of the empire, situated in a beautiful and fertile valley. There were several causes which helped on the Osmanli besides their own daring and power in arranging the best ways to fight. The rulers of the old empire were weak and foolish; the Balkan Christians were fiercely destroying each other while the hour of their doom was coming nearer; and the other Christian peoples around, the Venetians, Genoese, Hungarians, Poles, Austrians, were too disunited, too busy with their own affairs, to join heart and soul against the powerful invaders at their gates.

BOYS OF CONQUERED PEOPLES DRILLED TO FIGHT AGAINST THEIR COUNTRIES

Sigismund of Hungary headed a force when the Turks burst through the Balkans; but they were too strong for him, and, afterwards, he was much taken up with persecuting John Huss, who was later put to death, and his followers. Later, the brave Hunyadi, with the Poles, defeated the Turks, but was afterwards in his turn defeated at the battle of Kossovo, which we see in the picture on page 3158.

Constantinople in these days was more and more becoming a city-state instead of the heart of a once mighty empire, and the Turks were more and more determined to have it for their

THE DOWNFALL OF CONSTANTINOPLE

Few big cities have been besieged and taken so many times as Constantinople. Since the middle of the sixth century it has undergone no fewer than twenty-six sieges and has been captured eight times. But its most terrible experience was in 1204, when it was captured by the Crusaders, as shown here. The city was given up to pillage; and the so-called Christian warriors acted more barbarously than any Turkish invaders have ever done.

The capture of Constantinople by the Turks in 1453 was another terrible experience for the ill-fated city, and about 60,000 men, women, and children were sold into slavery and dispersed all over the Turkish Empire. But the fall of Constantinople was not merely an ordinary historical incident, or simply the triumph of Crescent over Cross; **it had more far-reaching effects than any other event in modern history, for by driving scholars with their books into Italy from the East, it helped the great revival of learning, and this again led to the Reformation.**

capital; so all the time they were increasing their ships and their army. One way of increasing the strength of the army was to make the conquered Christian peoples give up the finest of their boys. These boys were brought up as Mohammedans, and drilled to fight against the countries which had given them birth. These troops were the famous Janissaries, or new soldiers, who helped so largely to destroy the Eastern Empire, and who, later, gained so much power over the sultans.

THE TAKING OF CONSTANTINOPLE, AND THE LAST CHRISTIAN SERVICE IN ST. SOPHIA

The ruins of the thick walls of Constantine's city show how strong were the defences when Constantine XI., the last emperor, stood bravely in the breach against Mohammed II. He knew the end was near, and at midnight had taken the Sacrament in the beautiful church of St. Sophia. Then, after a short rest in his ruined palace, he sadly mounted his horse and rode away amid the sobs of the crowd to the post of danger. Before long the besiegers made their entrance over his dead body. The streets were deserted, for the people had gathered in St. Sophia in frantic prayer, expecting a miracle to save them. Alas! a piteous wailing went up as they were dragged out to be killed or sent to slavery, and then, only a few hours after the celebration of Constantine's last act of Christian worship, the loud voice of the Mohammedan crier rang out through the huge building: "God is great, and Mohammed is His prophet." This was on May 29, 1453.

St. Sophia still stands in its grandeur, and many of its beautiful mosaics still tell of its Christian past, though for more than four centuries it has been used as a Mohammedan mosque.

THE FLIGHT OF THE LEARNED MEN, AND THE BIRTH OF THE NEW LEARNING

This conquest by the Turks of the old Greek Empire, and particularly that of Constantinople, caused the flight of many students and learned men, with the manuscripts they so much loved, towards the West, chiefly to Italy. In Florence, Lorenzo the Magnificent gathered round him men who were interested in the old Greek manuscripts and in the wonderful old Greek art. The knowledge of these writings and of this art had been shut up so long in the East that when the study of them was revived it was called the New Learning, and the New Birth of Art. Many scholars from all over Europe journeyed to Italy in those days, and returned to their own countries to fire others with enthusiasm for the study of Greek and its wonderful literature. "I have given my whole soul to Greek learning," writes Erasmus, the friend of More and Colet, from Paris, "and as soon as I get any money I shall buy Greek books—and then I shall buy some clothes."

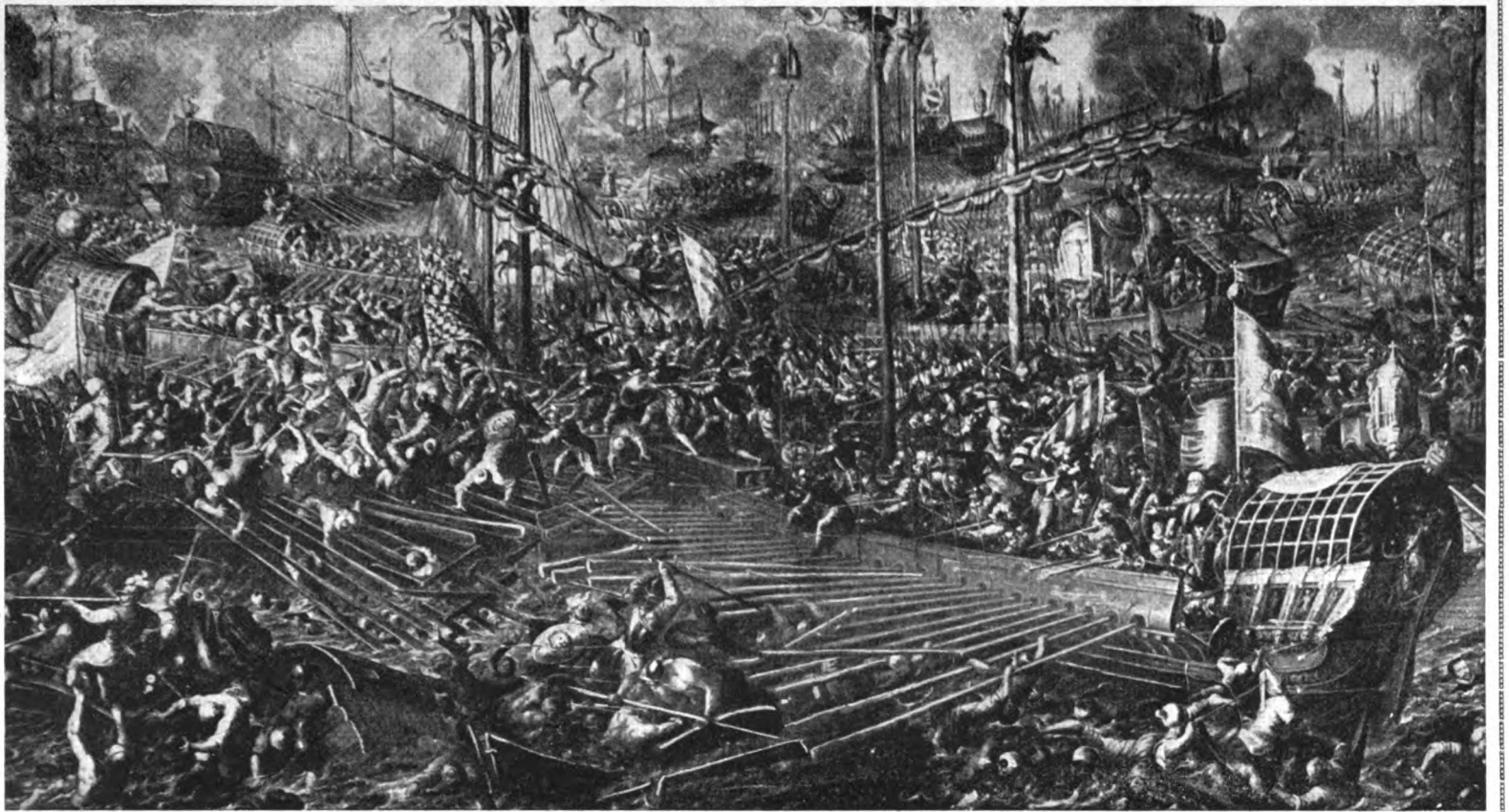
During the years that followed the taking of Constantinople, the crescent on the Ottoman banner shone triumphantly over an immense and powerful empire from the Danube to the Euphrates, from the Caspian Sea to the Straits of Gibraltar. The discipline and unity of purpose of the Mohammedans prevailed against the jealousies and quarrels of the Christian kingdoms. Deeds of daring and heroic resistance on their part were not wanting, and there were terrible revolts and massacres; but so bitter were the jealousies between Christian rulers, so intense the hatred between the East and West branches of the Church, and between Catholics and Protestants, that not only was there no united front against the followers of Mohammed, but on several occasions Christians sought alliance with them against their fellow Christians.

THE SULTANS OF TURKEY, AND THE MAGNIFICENCE OF SULEIMAN THE GRAND

Among the Turkish rulers—who came to be called sultans—were many strong and clever men. One of the greatest was Mohammed II., who had ridden over Constantine's body and up the nave of St. Sophia on that eventful day in May, 1453. He ruled for thirty years, and conquered Servia, Bosnia, and Greece.

Suleiman the Magnificent lived at the same time as the trio of Western kings, Henry VIII. of England, Francis I. of France, and Charles V. of Germany. An old German song shows the terror which this "Grand Turk" cast over the Holy Roman Empire. It says: "The furious Turk has lately brought great forces into Hungary; from Hungary he has quickly entered Austria in the light of day; Bavaria is his for the taking, thence he presses onward and may soon come to the Rhine, for which cause we have no peace or rest."

THE BATTLE OF LEPANTO, WHERE TURKEY LOST HER SEA-POWER



For more than a century after the capture of Constantinople, the Turkish Navy was thought to be invincible. But at the battle of Lepanto, in 1571, Don John of Austria, a son of the Emperor Charles V., so routed the Turkish fleet that Turkey for ever lost control of the sea, and her conquering progress in the West was stopped. The Turkish fleet consisted of 277 ships and 120,000 men. The Christian forces were made up of the fleets of Venice, Spain, the Pope, and the Knights of Malta, but it was Don John's skill that won the day.

It was said of Suleiman that while he ruled, sword and pen were never dry, so continually was he fighting, and so great was the number of writers in his day. It was he who swore he would take no rest till the prayer of the prophet rang out from the tower of St. Stephen's Church, in Vienna. But his quarter of a million Turks were obliged to retire from the gallant city, and so the spread of the Turkish power in the valley of the Danube was checked for a while.

A LONG LINE OF WEAK AND CRUEL RULERS OF THE CONQUERING TURKS

A few years after Suleiman's death, at the great naval battle of Lepanto, a limit, too, was set to Turkish power in the Mediterranean and upon the sea generally.

After this came a succession of weak and cruel rulers, and under them there were wars with the Persians, mutinies of the Janissaries, who had become a very rich and strong body, and other disasters. Ottoman power rose again for a time under the able rule of a family named Kiuprili, many of whom acted as prime ministers, or chief viziers. It was under one of these men that the Turks determined to try their fortune again at Vienna. Enormous preparations were made, and alliances renewed with most of the surrounding nations, so that the emperor should be left without help.

The vast hosts advanced, spreading terror and desolation in their way. Then they encamped before Vienna. The peasants had crowded into the city from the country round. There was but a small garrison, the old walls were out of repair, and the Turks, the best engineers and artillerymen in Europe, soon undermined them and drove off the emperor's soldiers.

THE STEADY EBBING OF THE TURKISH POWER IN EUROPE

At last, after two terrible months, when it seemed only a question of days before the Turkish general would gain the glory of receiving the submission of the devoted city, a troop of Poles was seen hastening down the vine-clad slopes, shouting "Sobieski for ever!"

The terror of the name of this gallant King of Poland, who had inflicted such terrible defeats on them before, filled the Turks with a panic, and they fled on all sides, leaving immense treasure behind them. The siege was raised, and the Turks were driven out of Austria. There is a picture on page 2850 showing the victorious Poles after the scattering of the Turkish camp.

Since this September day in 1683 the tide of Turkish power in Europe has steadily ebbed. No more did the sultans threaten and terrify the whole world, though they still had some successes, and continued for many years to keep in wretched bondage and misery the Christian nations of the Balkan Peninsula.

The Turks were driven out of Hungary; many towns and islands in the Mediterranean were taken from them; Greece passed for a time to the Venetians before entering on its long final struggle for freedom against the Turks. The Russians, now growing into a Power in Europe, captured Azov, on the Black Sea, and by degrees its northern shore passed into their hands. Ships on the Black Sea meant power to threaten Constantinople, and perhaps too much influence in all the four seas that wash the shores of the various Balkan countries.

THE GREAT CHANGES THAT CAME WITH THE GROWTH OF RUSSIA'S POWER

With the growth of Russia's power came the right to interfere in the provinces north of the Danube, particularly Moldavia and Wallachia, which were dependent on Turkey. This country's frontier fell back to the Dniester, then to the Pruth, and for many years the old kingdoms were alternately under Russia and Turkey.

The growth of Russia had a great effect in restoring to power the Eastern or Greek Church. It had years of depression while it was the religion only of the oppressed and ever-rebelling subjects of the sultan, and of the Russians, who were few in number. But as the Church of a chief Power in Europe, it bound that Power in sympathy with its poorer brethren of the smaller and despised nationalities, and gave many chances of encouraging their revolts.

How these revolts helped to bring freedom, and how they failed, we read in the next STORY OF COUNTRIES, where also we read the amazing story of Turkey's efforts to set herself free.

THE NEXT STORY OF COUNTRIES IS ON 3219

JACK AND THE BEAN-STALK

CONTINUED FROM 3124

A VERY poor widow woman once lived with her only son, Jack, in a little cottage on the border of a great wood. They were so poor that often Jack went supperless to bed; and at last things got so bad that Jack's mother made up her mind to sell their cow, the one possession they had left. So, when market-day came round, Jack set out, driving the cow before him, determined to make the best bargain he could.

On the way he met a man with a bag of beans in his hand. Jack took such a fancy to the beans that he begged the man to give them to him.

"No, indeed," replied the man. "They are magic beans. But you shall have them in exchange for the cow."

To this the boy readily agreed. The man took the cow, well pleased with his bargain; and Jack ran home to show the beans to his mother. The poor woman wept when she heard the story, and was so angry at Jack's stupidity that she flung the beans out of the window.

Jack went to bed very cross that night, but when he got up the next morning he was surprised to find something in front of his window. It looked like a huge tree; but, on going nearer, he found that during the night the wonderful beans had twined together and grown to a tremendous height; indeed, the top of the stalk was almost out of sight.

In a twinkling Jack sprang up the bean stalk. Higher and higher, and still higher he climbed, until he began to lose his breath. When he at last reached the top, he found himself in a strange country. He walked along a little way, and presently met an old woman. Jack had never seen her before; but, to his great surprise, she said:

"I know you quite well, Jack. Years ago a wicked ogre killed your father and stole all the money which should rightly belong to you. This ogre lives close by; and if you want to punish him, I can help you."

Jack replied that he certainly did want to punish the ogre, and asked where he lived.

"In that great castle over yonder," replied the old woman, who was a witch, and with that she vanished.

Jack made his way to the castle which the old witch had pointed out, boldly mounted the steps, and rang the bell. A woman opened the door; and Jack asked for a night's lodging.

"Alas!" replied the woman, "I dare not take you in. My husband is an ogre, and if he finds you he will surely kill you and roast you for supper."

"But can you not hide me?" asked Jack, who was no coward.

"I will do my best," said the woman; "but you must promise to go away the first thing in the morning."

When Jack had promised, she took him into the kitchen and gave him a good meal; but before he had finished, there came a tremendous knock at the door.

"Quick!" cried the woman. "Jump into the oven, and don't make a sound till my husband has gone to bed."

In scrambled Jack; and a minute later the ogre strode into the room.

"Wife," he cried out, in his terribly loud voice, "I can smell fresh meat!"

Jack trembled at the voice of the ogre.

"Nonsense, my dear!" he heard the wife say. "See what a fine supper I have prepared for you."

The supper was so good that the ogre instantly sat down and made a good meal, and when he had finished he told his wife to bring in his favourite hen. She went outside, and returned with a beautiful hen, which she set down on the table.

"Lay an egg!" commanded the ogre; and the hen instantly laid a golden egg.

"What a useful bird!" thought Jack.

Soon after this the ogre fell asleep, and snored so loudly that his snores shook the walls. As soon as Jack heard them, he crept out of his hiding-place, picked up the hen, and ran away. On and on he ran until he reached the bean-stalk, which he climbed down as fast as ever he could go. When he reached the bottom he flew to his mother and told her what had happened. The widow was overjoyed, and called Jack her "brave boy." They sold the golden eggs which the wonderful hen had laid, and lived very comfortably for some time on the money they were able to get for them.

Jack reached the bean-stalk, and began to climb down it quickly with the harp, while the ogre followed in hot pursuit.

But after a while Jack began to long for more adventures. So one day he disguised himself as well as he could, climbed up the bean-stalk, found his way to the castle, and again asked the ogre's wife to give him food and lodging. But the woman shook her head, and said that the last time she had befriended a poor boy the ungrateful wretch had repaid her by stealing the ogre's favourite hen. But Jack begged so hard that at last she consented, and this time hid him in a cupboard.

Presently the ogre returned to the castle. As he entered the kitchen, he cried out in a terribly loud voice:

"Wife, I smell fresh meat!"

"Nonsense, my dear!" replied his wife, as before. "See what a fine supper I have prepared for you."

The ogre sat down and ate his supper. When he had finished, he roared:

"Bring me my money-bags!"

His wife brought the bags, and laid them on the table. The ogre counted his money, put the coins back into the bag, and then fell asleep. Out jumped Jack, caught up the money-bags, ran out of the castle, and was soon back again in the cottage.

"You need not mind spending all this money, mother," he said, pulling the bags out of his pockets one after the other, "for that bad man stole it from my father, and it is all our own."

Some time after this Jack once more climbed the bean-stalk and made his way to the castle. This time he dare not let the ogre's wife catch sight of him, but after waiting about for some hours he managed to slip in and conceal himself in the copper just before the ogre returned.

"Wife, I smell fresh meat!" roared the ogre, directly he set foot in the kitchen.

"Oh, no!" replied his wife. "You are always fancying there is someone in the house. This time I am certain you are mistaken."

When the ogre had eaten his supper, he called for his harp. His wife brought it and set it on the table, and at a word from the ogre it began playing by itself. This so pleased Jack, who was peeping over the top of the copper, that he determined to have it.

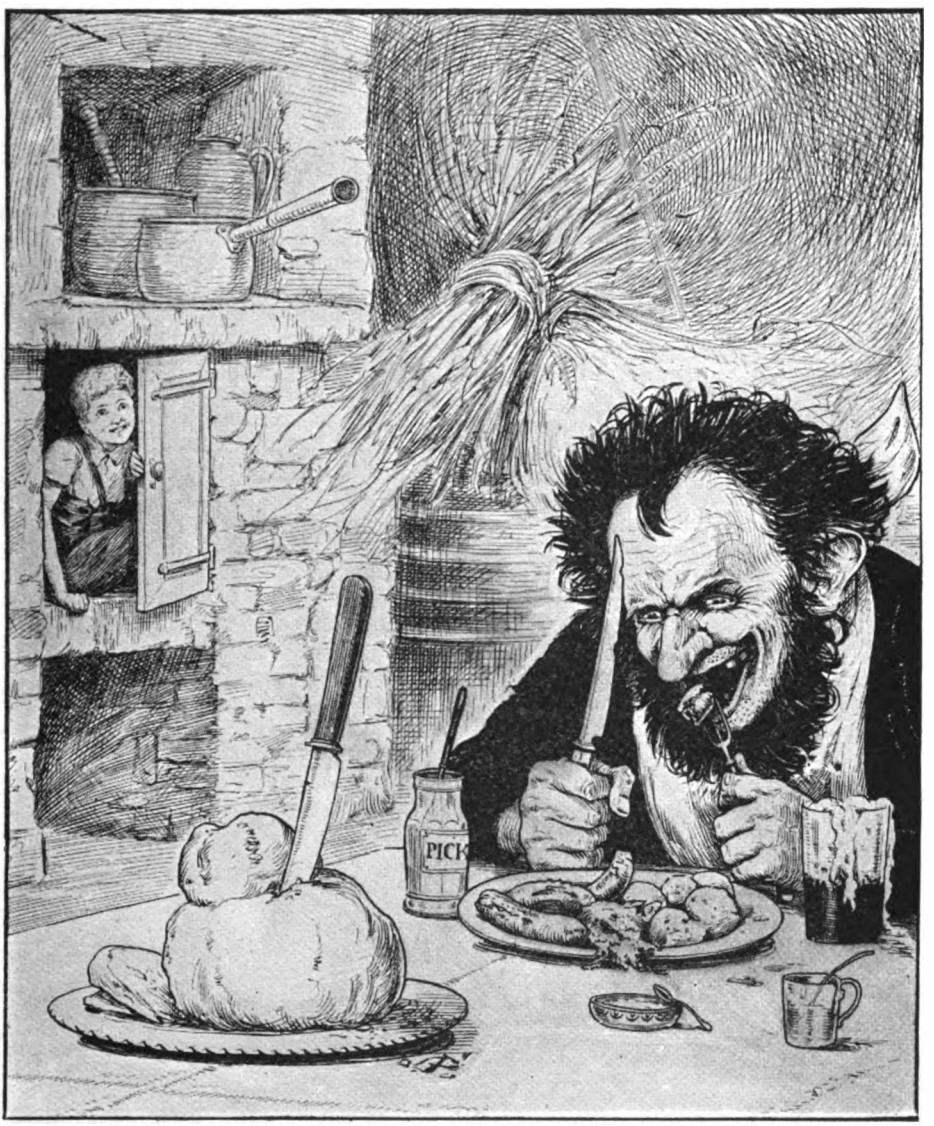
As soon as the ogre was safely asleep, Jack jumped up, seized the harp, and flew out of the room. But the harp was a fairy harp, and directly Jack picked it up it shrieked out:

"Master! Master!"

The ogre woke up instantly. He started up, and, seeing what had happened, rushed after Jack, who was running away as fast as his legs would let him. He reached the bean-stalk, and began to climb down quickly. When he reached the ground, the ogre was nearly half-way down. Jack saw that there was not a moment to be lost.

"Mother! Mother! Bring the hatchet. The ogre's coming down!" he shrieked.

Out rushed Jack's mother. Jack seized the hatchet, and with a single blow cut the bean-stalk right through. Down fell the ogre with a frightful crash, and so ended his wretched life.



WHILE JACK LAY HIDDEN IN THE OVEN THE GIANT ATE A GOOD SUPPER

Jack and his mother lived many happy years after this. When Jack grew to be a man, he fell in love with a beautiful princess and married her, for by that time Jack was rich and his adventures had made him famous.

HOW TRUTH GOT TO THE BOTTOM OF A WELL

Ding, dong, bell!

Tommy Lin let go his hold, and Pussy descended with a rush into the darkness of the well.

"Pussy's in the well!" screamed everybody on top.

"Who threw her in?" squeaked the mice.

"Little Tommy Lin," cawed the rooks.

And while they shouted on top, Pussy fell, and fell, and fell.

"Now for the bump," she sighed, as the dark and oily floor of the well rushed up at her through the water.

But instead of a bump, she fell into the lap of a Spinster, who was sitting on a marble bench, with a little lamp burning at her side. The Spinster looked calmly down on Pussy, fondled her ears, and stroked her soft fur, and smiled at her.

"Well, I never!" said Pussy. "How did you get here? Did that little rapscallion of a villain, Tommy Lin, throw *you* in, too?"

The Spinster shook her head.

"Who are you?" asked Pussy.

"I am called Truth."

"Indeed! And how did you get here, pray?"

"Democritus placed me where you found me."

"And who was he, to be sure? Grandfather of Tommy Lin, I'll be bound."

"Democritus," replied Truth, "was one of the greatest philosophers of antiquity. He devoted his life to discovering facts. Instead of living in Athens and enjoying himself like the other philosophers, he spent his days in searching for facts. He journeyed to Europe, Asia, and Africa—all to get facts. And when he got back to his native city of Abdera, he took up his dwelling in a cave in a garden just outside the city, and there spent his life laughing at the foolish notions of ignorant people."

"Did he, though?"

"The people thought he was mad, and sent the learned doctor Hippocrates to have a talk with him. But when Hippocrates came away, he said that it was not Democritus who was mad, but his accusers. Democritus, he said, did quite right to laugh at the absurdities and follies and stupidities of ignorant, superstitious people. It was a mad world. Democritus was about the only sane man alive."

"If I had my way with the human race," said Pussy, "I wouldn't laugh at them, but I'd convert the whole lot of them into mice, and say to my family: 'Enjoy yourselves.'"

"The human race has learned a great deal since Democritus," replied Truth; "and you mustn't judge them from your experience of Tommy Lin. They are trying their best. And though they keep me here in this dark, gloomy, and hidden place, you will certainly never hear me express any feeling for them except the feeling of pity."

"Why did Democritus place you here?"

THE SPINSTER LOOKED CALMLY DOWN ON PUSSY, AND STROKED HER SOFT FUR

THE PEOPLE THOUGHT DEMOCRITUS WAS MAD, AND SENT HIPPOCRATES TO TALK WITH HIM

"He said that he had searched everywhere for Truth, and could not find her, and that, therefore, she must be at the bottom of a well. Everybody said: 'Ah, that is quite true; we shall never discover Truth; she lives at the bottom of a well.' They were rather glad than otherwise. But some of the honest people in those days began at once to look into wells to find me; and, as I want to be discovered, I had to take up my residence in some well or another, or else never be discovered at all. So I chose this well, whose name is Inquiry, and where I noticed the most honest men were inclined to look. But for Democritus, I should never be here at all. He has imprisoned me; but he has located me. I am hidden; but men know where to look for me. I am not angry with Democritus. He was an honest man."

"And how do you spend your days, ma'am?" inquired Pussy, glancing round for mouse-holes. "Is it dull at all?"

"Seekers after truth," replied the lady, "are continually sending down little buckets which have interrogation marks for hooks. These little questioning buckets, made by the labour of scholars and thinkers, are too small to contain me myself, but I fill them with as much of the sacred water of Knowledge as they will hold. That is how I spend my days."

"It the stupids only knew you were here yourself!" Pussy remarked, as she glanced inquiringly at Truth.

"Oh, there are plenty of people among them who would stop the inquirers from sending down a bucket big enough to hold me, even if it were possible to make one. I am not a welcome guest on the earth to a very great number of important people. Some of them say that even to inquire after me is wicked. Most of them are afraid of me. It is only the few who know that the business of life is to discover Truth."

Pussy looked wise, and rubbed one ear with her paw. "What you say is true," she said.

"It is!" rejoined Truth. "Some of the people on earth are so intent upon getting riches that they will do anything to attain them. These people, more than any others, do not like me. I have been a stranger to them for so long that very few of them would recognise me now.

"Now, *I'd* like to live with you all my life," replied Pussy. "But, there, I'm a cat; there's some sense about me!"

Just at that moment down came a bucket. Before Truth could say "Jack Robinson," let alone fill the bucket, in sprang Pussy, and, giving the rope a pull and exclaiming "Top floor, please!" without a single word of farewell or explanation to Truth, she shot up to the top.

"If there were mice down there, it would be a different matter," said Pussy, as she reached the surface, and began casting about an anxious glance to see if she could discover Tommy Lin.

LITTLE JACOB'S FRIEND

THERE was a little boy named Jacob who lived by the Docks in London, and whose legs were so twisted and thin that he could only get about the streets on crutches.

His father worked in the Docks, loading and unloading the great ships, whose tall masts Jacob could see above the roofs of the houses. There were many children in this family, and his father could only give poor Jacob very cheap crutches, which were too short for him and hurt his arms and bent his back; and so poor little Jacob grew more and more ill, until his parents thought he wou'd die.

Well, one hot summer day, as Jacob lay on his bed beside the open window, listening to the sounds of children playing in the street, and gazing over the roofs and between the chimneys of the opposite houses at the tall masts piercing the blue and cloudless sky, he heard strange voices in the room underneath, and then he heard his mother crying, and he thought to himself, "They have come to tell mother that I am going to die." But presently there was a sound of footsteps on the stairs, and the voices became cheerful and happy. And then the latch of the bedroom door was lifted, and in came his mother, followed by a very beautiful lady with a pretty little girl clinging to her hand.

The lady came to Jacob's bedside and stooped down and kissed his poor little wan forehead, and spoke to him as if she had known him all her life.

Then the little girl kissed him, too, and said, "I hope you will soon be better, Jacob." And his mother brought chairs, and the lady and the little girl sat down beside Jacob's bed, and Jacob could not think what had happened to bring him these beautiful visitors, whose dresses seemed to smell like a conservatory.

"There is someone who loves you very much, Jacob," said the lady, "and who is very sorry to know that you suffer pain. She is a great lady, the very greatest lady in the land, and her name is Queen Alexandra."

Jacob's eyes opened wide, and then he smiled and looked at his mother.

"It is quite true," said the lady. "Queen Alexandra loves you so much, and is so sorry for you, that she spends many hours of the day in her beautiful palace thinking what she can do to make you happy. And she has sent me to you, because my little girl is one of the helpers in Queen Alexandra's League, to tell you that there is a beautiful bed for you, in a beautiful big house in the country, and that you are to be carried there and nursed till you become well and strong."

"And you will have a garden all to yourself, Jacob," said the little girl, "where you will be able to grow your very own flowers."

"And they'll teach you a little trade, sonny," said the mother. "You'll like that, won't you? You'll be earning your own living before you know where you are."

All this sounded like a dream to Jacob, and he could only say, "You're sure it ain't gammon?" It beat him altogether to think that the Queen of England knew of his pains and wanted to make him better. But one day a nurse came, and there was a cab at the door, and all the neighbours crowded round to say good-bye, and Jacob drove off like a hero to the railway station, and was lifted by the kind nurse into a carriage, and was carried out of London into the country.

It was quite true what the lady had told him. There was a bed ready for him, and a piece of garden, and the house was so big and beautiful that it seemed to him just like a palace.

He met there other little cripples, and made heaps of friends, and listened to the birds singing in the trees, and enjoyed the scents of the flowers and the smell of the upturned earth; and his dreams were all of lovely things. And he learned to read books; and everybody about him was so kind that he quite loved them all, and wondered if heaven could really be as nice as this beautiful house.

One day, as he was in the garden, kneeling on a mat, and picking out the weeds from his flowers, he heard the rustle of a dress close behind him; and a voice he had never heard before called him by his name. He looked up quickly. A lady stood there. He

could see through her veil that her eyes were moist with tears. Jacob's heart beat. The lady bent upon him a look of such kindness that he felt the tears suddenly surge into his eyes. He knelt on the mat, looking up at the strange lady, and feeling as if he must cry. But the beauty of the lady prevented him from weeping; he felt that she must have stepped out of a picture or a coloured window; and he stared at her face as if he had seen a vision.

A lark was singing in the blue sky above the lady's head, and all about her were the beautiful flowers of the cripples' garden. She was like an angel. As Jacob stared at her, he became suddenly pale and his eyes started. It was quite true, then! It was really, really true. Jacob was conscious of the heat of the green grass, the smell of the flower-bed, the song of the lark, the blue of the sky. But these things were as nothing to the vision of the great lady.

"Are you happy, Jacob?" asked the lady.

He nodded his head and swallowed a lump in his throat.

"Do you know who I am?"

He nodded his head again, quickly this time, shaking a tear from his eyes.

"Have you seen me before?"

He shook his head.

"Then how do you know who I am?"

"The pictures," said Jacob, rubbing the earth from his little thin hands. "Only you're much more prettier than the pictures."

The lady smiled.

Then she stooped down and put her hand upon his head. "I am glad you are happy," she said gently.

"You want all the little cripples in England to be happy, don't you?" he asked.

"Yes, Jacob."

One day, as Jacob was weeding his garden, he lcoked up and saw a beautiful lady watching him.

"Mustn't you have a heart, just!" said Jacob, with enthusiasm. Then he plucked his best flowers very quickly, and lifted them up to the lady. "They're yours," he said. "They belong to you. I belong to you. All the cripples belong to you."

She took the flowers, lifted them to her face, and then, leaning down, gave them back to Jacob. "I want you to send them to your mother, with my love."

"With your love!" cried Jacob. He got up quickly, picking his crutches from the ground, and made off at a tremendous rate for the Home.

"Nurse, nurse!" he cried, as he entered. "I'm to send 'em to mother, in a cardboard box, and I'm to write that the Queen sends 'em to 'er with 'er love. Just fancy! The Queen sends 'er love to my mother!"

. . . .

On the mantelpiece of the parlour of the little home by the Docks there is a coloured mug which once belonged to Jacob, and in the mug are the faded and yellow flowers sent to Jacob's mother by the Queen of England.

Often the father and mother look up at the dead flowers as they sit by the fire at night, when all the other children are asleep upstairs; and Jacob's father sometimes says, solemnly and slowly:

"Them flowers has been touched and smelled by the Queen of England. Them flowers up there, in my little lad's mug, touched and smelled—actually touched and smelled—by her Majesty the Queen of England."

"And she sent 'em to me," says Jacob's mother, "with her love."

"Mother," says Jacob's father, "there's only one thing I'm afeared of. We shall soon be too proud to live.

LEGENDS OF ENGLISH PLACES

A legend means a very old story, often so old that we cannot tell whether it may ever have been true. Perhaps most stories called legends may have some truth in them, but as a rule they are to be read just as we read fairy tales. Histories are stories of facts, legends are stories that may have been facts, but most likely were not.

THE LUCK OF EDENHALL

EDENHALL is the country seat of the Musgrave family. Its greatest treasure is a strange drinking glass, which came into its possession in a wonderful way.

One midsummer night a troop of fairies were holding their revels in the grounds of Edenhall, when one of the Musgraves disturbed them. They hastened away, leaving behind them, on the grass, one of their drinking cups. Then, as the intruder stooped and picked it up, the fairies said :

If this cup should break and fall,
Farewell the luck of Edenhall.

So the cup is called the "Luck of Edenhall," and great care is taken to preserve it from all injury.

THE PITS OF WOOLPIT, IN SUFFOLK

JUST outside the little village of Woolpit, in Suffolk, there are some curious pits, or trenches. One autumn, when the reapers were gathering the harvest in the fields close by, a boy and a girl came up out of the pits. They were wonderful children. Their bodies were of a green colour, they were dressed in a strange stuff, and they spoke in an unknown tongue. Nobody could understand them, but a kind woman adopted them and brought them up.

At first they would eat nothing but beans, and the boy pined away and died. The girl, however, grew hale and handsome, and learned to speak English, and was married to a farmer.

She said that she came from the country of St. Martin, which was a Christian country, and contained many churches. No sun ever shone there, and the people lived in a dim twilight ; but across the river by which they dwelt they could faintly see a region of sunshine.

"One day," the girl said, "I and my brother were tending our father's sheep by the riverside, when we heard the sound of bells, like the bells of Bury St. Edmunds. Then all at once we found ourselves in the pits of Woolpit.

No one has yet discovered the twilight land of St. Martin, and the pits of Woolpit are now almost filled up.

THE NEXT STORIES ARE ON PAGE 3203.

THE FAIRY FOUNTAIN OF KILLARNEY

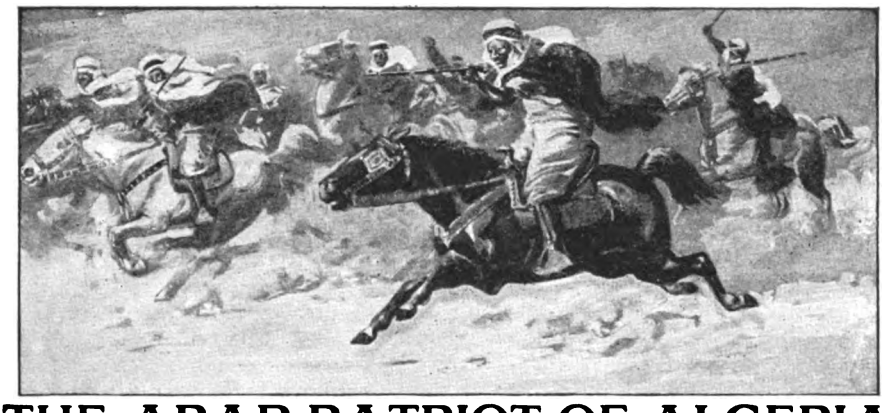
IN days gone by, the valley of Killarney was covered with rich cornfields and pleasant pastures, and in the middle of it was a fairy fountain. This fairy fountain had to be sealed down with a flagstone, to prevent the water from rushing out ; and every morning and evening the pretty daughter of the farmer of Killarney went with her serving-maids and took the flagstone from the fountain. When the maids had filled their pitchers, she carefully put the stone back again.

One evening, just as the maids departed with their pitchers, a handsome knight rode up to the fairy fountain, and began to make love to the farmer's pretty daughter. She forgot all about the flagstone, and went wandering with the knight on the hills, amid the rocks and bushes. Suddenly she remembered, and ran wildly down the hill to seal up the fountain. But it was too late. The valley was flooded with water, and over the cornfields was a calm and beautiful lake. Happily, no one was drowned, and, as the knight married the farmer's daughter, and took them both to live in his castle, the farmer was not troubled by the loss of his lands.

THE GIANTS AND THE ISLE OF MAN

THE Isle of Man is a large and beautiful island lying in the sea between England, Ireland, and Scotland. They say it was made in a very strange way. There was once a red-haired giant in Scotland who was always boasting that he was the strongest creature on earth, but a giant in Ireland challenged him, and they met at Lough Neagh to fight.

There was a terrific struggle, and the Scottish giant got the worst of it, and fled. As he leaped into the sea and swam towards England, the conqueror sent him a parting gift. Thrusting his gigantic hands into the earth, he tore up a vast mass of rock and clay, and threw it at the Scottish giant. But he missed him, and the vast mass sank and became an island. King Man, father of King Lear, afterwards lived there, so it was called the Isle of Man.



THE ARAB PATRIOT OF ALGERIA

CONTINUED FROM 3010

ABD - EL - KADER, whose name means "servant of the mighty God," was an Arab of Algeria, born in 1807, and a man of remarkable character. With a fine and graceful figure, and a body of great strength and endurance, he was unsurpassed in courage, profoundly learned, and had high standards of duty and honour. He had, too, a powerful influence for good over all with whom he came in contact. When a young man of twenty-six, he left his life of study and religious meditation to lead his people as Sultan against the French invaders, and for fourteen years he tried to free Algeria from the foreign yoke, and form a great Arab nation.

Alone, or with a few horsemen, he would appear in a remote part of the Atlas Mountains, or in the Sahara, and rally thousands to him. When the French anticipated an attack in their rear, he would suddenly appear in front, as we see in the picture. He could shoot accurately while standing in the saddle, with his black Arab horse speeding like lightning; or he would enter a town and harangue the servile townsfolk into defence of their country and religion. He treated his prisoners as guests, sending them money, clothes, and food. Formerly, Arabs had killed their prisoners. Some women were once captured and brought to him, and as he set them free he exclaimed in anger: "Lions attack strong animals; jackals fall upon the weak." Often Abd-el-Kader and his brave followers had insufficient food, or galloped for days together over the desert sands. Once when they were living on acorns, a stray sheep was brought to him. "Take it to my starving soldiers," said the leader.

But the resources of France were limitless, and though many armies were sent in vain, 100,000 disciplined troops in the end overcame the little remnant of the Arab forces. Even then, when Abd-el-Kader wandered with hardly a follower, such was the terror of his name that the French had to keep a large army on foot.

Not until his cause was utterly hopeless, in 1847, did this brave man surrender, on condition that he and his family should be free to live in Alexandria or St. Jean d'Acre. That promise was not fulfilled, for he was kept a patient prisoner in France for many years. They offered him wealth, a château, a guard of honour; but he indignantly refused them, demanding that France should redeem her pledge. In 1852 Louis Napoleon saw that this was done, and he was set free.

In 1860 a Turkish mob rose against the Christians of Damascus, where Abd-el-Kader was then living. With some Algerian soldiers he saved the lives of 15,000 people. From that time honours and distinctions were heaped upon him, until his death, in 1883.

THE GIRL WHO SOLD HER HAIR

At the time when Napoleon was trying to conquer all Europe, and state after state was falling a prey to his grasping ambition, Silesia, a German territory, was doing her best to beat back his invading armies. Every-one in that freedom-loving state was wrought up to a passion of ardent patriotism in the terrible year of 1813, giving all he could to the cost of equipping an army for defence.

A Silesian girl had no fortune to put at the service of her country. Her small possessions were of hardly any value, yet she burned with eager-ness to help her countrymen in their fight against the invader.

One day the idea came to her that she might sell her thick, long hair, and so obtain some money. She accordingly set off to Breslau, where she sought out a hairdresser, and offered him her tresses. He could not understand why she should want to part with her beautiful hair, so she had to tell him the reason. Then he agreed to cut off her hair, but could not afford to give more than two dollars for it. The bargain was made, the hair was cut off, and the girl returned home.

The hairdresser was so touched with this instance of self-sacrifice that he would not part with the hair in the usual way, but used it in making various orna-ments such as bracelets. The story of what this Silesian maiden did for her country became known. All Silesia was proud of the act, and articles made of her hair were eagerly bought. So much were they in demand that the hair-dresser reaped a golden harvest, and contributed a large sum to the state.

A PRINCE WHO GAVE UP HIS FREEDOM

In the Middle Ages, Ceuta, which lies just opposite Gibraltar, on the north-west coast of Africa, was a hot-bed of piracy, and King João of Portugal and his sons made an expedition to it, captured it, and released the Christians imprisoned there. Eighteen years later, in 1433, King João died, and soon after two of his younger sons, Henrique and Fernando, laid siege to Tangier, a town farther along the coast.

But the Moors, with their allies, surrounded and entrapped the little army. They were unable to reach their boats, had no food, and were forced to give to the Moors a hostage for the delivery of Ceuta. Prince Fernando offered himself, and then his brother had to leave him. Their elder brother, the King of Portugal, sent a fleet to Ceuta, but nothing was done, and Prince Fernando remained a prisoner.

Soon the Moors were angered that no ransom was sent, and that Ceuta was not yielded to them, so in revenge they mal-treated and starved the prince. Now, his mother was Philippa, the daughter of John of Gaunt of England, who had brought up her son to be a man worthy of his knighthood. So Prince Fernando bore his troubles patiently, enduring all so that Ceuta might remain in the hands of his Christian countrymen.

The king, his brother, tried to raise an army to free him, but he caught the plague by which Portugal at that time was being desolated, and died from it. His little child, aged six, became king, and quarrels disturbed the land, and thus, as the years passed by, hope of release for patient Prince Fernando grew less and less.

Two kings in Spain, however, touched with admiration and pity for him, planned to attack Tangier and release him, but that only led to his being sent to the King of Fez inland. He put the prince first in a dungeon without light or ventilation, and then made him labour among Christian slaves. But Fernando was so kind to them, and behaved so nobly, that even the King of Fez expressed admiration for him.

After ten years in prison for the honour of his country, brave Prince Fernando died. The Portuguese hold his memory very dear, and call him Prince Constant. The poet Calderon, too, wrote a great play, and made him the hero of it. And though his life was seemingly offered in vain, Ceuta has ever since belonged to the Christians; for when it ceased to belong to Portugal, it passed into the possession of the Spaniards. Thus, what Prince Fernando gave his life for was really accomplished — the rule of a Christian prince at Ceuta.

The next Golden Deeds are on page 3253.

GOLF FOR BOYS AND GIRLS

CONTINUED FROM 3070

GOLF is one of the few outdoor games in which boys and girls can compete on equal terms.

A golfing outfit for a boy or girl consists of four clubs, which are called a driver, a cleek, a mashie, and a putter, and they should be carried in a light canvas bag. The driver is a wooden-headed club; the cleek, mashie, or "lofter," and putter are iron headed; and the cost of each is from a dollar up. In addition there should, of course, be two or three golf-balls.

The driver is used for driving off from the tee; the cleek is for an "approach" shot—that is to say, for the intermediate shot, or shots, less than a hundred yards in distance, and taken between the spot where the ball rests after we have made our drive and its arrival at the green. The mashie, or lofter, is employed in place of the cleek if the lie, or position, of the ball is awkward—if, for example, it is in a hole or has rolled into a bunker, or is lying on very rough ground. Owing to the curious shape of the head of the mashie, it is specially useful for "lofting" the ball up out of a difficult place, which is done by striking the ball very low down, almost from underneath, in fact. The putter is used when the ball is on the green, to play it into the hole.

A match usually consists of two players. When four players play together the match is called a "foursome," each pair of partners in this case sharing a ball, and taking it in turns to strike. An ordinary full-sized golf-links consists of eighteen holes, each of which is set in the middle of a putting-green, and it is the object of the player to get the ball into each hole in fewer strokes than his or her opponent.

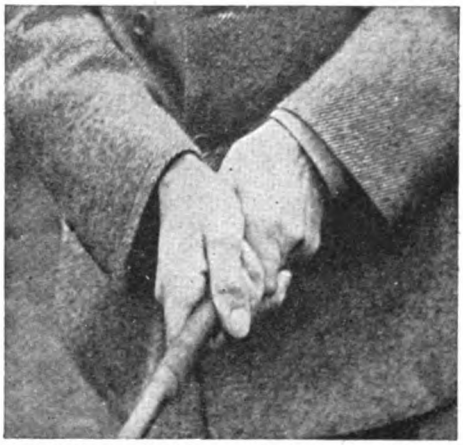
Close beside each putting-green there will be found a teeing-ground—a small, flat, slightly raised platform, which is provided with a box of sand and an indicator showing the direction of the next hole. Now, a proper golf-links is laid out in such a manner that the direct line from each teeing-ground to the next hole is comparatively clear of obstacles, so that by correct play it is possible to reach the putting green surrounding the hole without getting into difficulties; any deviation from this straight course, however, will be found to lead the player into trouble. His ball will get into a bunker, either natural or artificial, for most golf-links are provided with specimens of each kind.

A belt of low-bushes, a ditch, a pond, a shallow trench filled with a layer of sand and with a bank of earth running the length of it on the opposite side, all make suitable bunkers, and the difficulty of getting through, or over, or out of any of these hazards, when once one is in them, will be readily understood. The player's principal object therefore is, firstly, to learn to hit a ball true in the centre with the middle of the club-head, so that it may travel straight, not "slicing" or pulling it to right or left, or topping it, so that, instead of soaring away for a hundred and twenty to a hundred and fifty yards, as it should do easily, before coming to earth, if properly hit, it pitches dead into some obstacle a short distance away, whence it can only be extricated after endless trouble. Often there is a bunker between the player and the straight line to the hole, but this is placed in such a position that a correct shot should carry the ball over it towards the green.

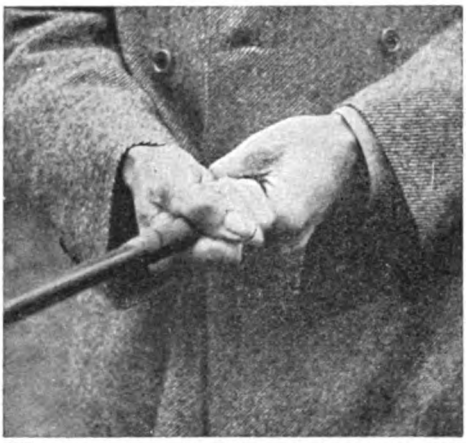
To begin the game, we must prepare to drive off from the teeing-ground. The first thing to do is to make a tee with a small handful of sand, pressing it together with the fingers to form a small pyramid. Upon the top of this the ball is lightly balanced, in order that the player may have a fair shot at it. Beginners usually like a rather high tee, while a practised player will use scarcely any.

It is important first of all to study the correct way to hold a club. It must be grasped in the fingers with both wrists above, and must not be held in the palms of the hands. A glance at the pictures on pages 3170 and 3171 will teach us more than any written description. In driving, the *left* hand is the guiding force, the master hand, and in taking hold of the club the left hand must grasp it first, and the right hand be afterwards placed below it in the position shown. In order to drive off from the tee we must stand in an easy position just opposite the

GOLF AND HOW TO PLAY IT



The right way to grip a golf-club is shown in this picture. The club must be held in the fingers and not in the palms of the hands. The left hand guides the stroke.



This picture shows the wrong way to hold the club. The wrists here are not properly over the handle, and the position and grip of the hands are quite wrong.

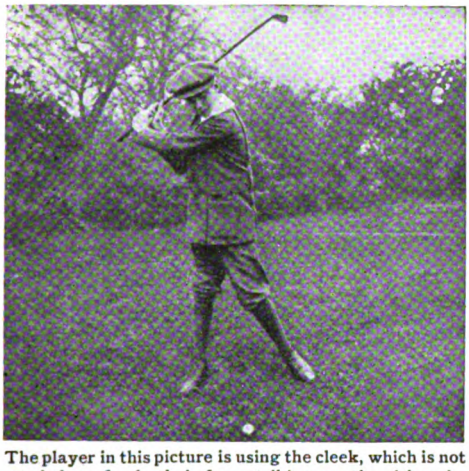
Here we see a player standing in the correct attitude and addressing the ball before taking his drive.

This is a view from behind of the player swinging back in driving, the wrists being held well under the club.

The wrong way to hold the club in swinging back to drive is shown here. The left wrist being over instead of under the handle, the player could not hit straight.

After striking the ball the club must continue its swing, ending well behind the head, the weight of the body being transferred from the right to the left foot in striking.

A HEALTHY GAME FOR BOYS AND GIRLS



The player in this picture is using the cleek, which is not carried so far back before striking as the driver is.

The stroke with the cleek is carried through in the same way as with the driver, but is not swung so far round.

These three pictures show the stroke with the mashie, a club adapted for "lofting" a ball over an obstacle. In the left picture the player addresses the ball; in the centre he is swinging back for a full shot; and the right-hand picture shows the finish of the stroke. Note that the player keeps his eyes on the spot where the ball was.

The putter is used on the green for knocking the ball into the hole. The player here is addressing the ball.

Here the player has struck the ball, which is about to drop into the hole, having run perfectly straight.

These photographs were taken at the Golf School, Royal Botanical Gardens, London, by permission of Mr. Norman Salmond, the manager.

ball, and at a convenient distance from it, with feet about a foot and a half apart, the weight of the body being distributed evenly between them. We must now "address" the ball, or act as though we were going to strike it, once or twice, to loosen the muscles of the shoulders and wrists, and judge the distance.

Then, standing with spine straight and stiff, head and neck bent a little forward, knees slightly bent, and eyes fixed on the spot just behind and beneath the ball, we swing the club up and behind the back of the neck until it lies almost across the back of our shoulders. Our entire weight meanwhile is transferred to the right foot, whilst the left foot rises upon the toe with the left knee turned inwards. The backward swing thus taken finally blends into one long, continuous movement. With the forward swing the shoulders come completely round and the weight passes from the right foot to the left, the right foot rising upon the toe, and the right knee turning inwards as we sweep the ball off the tee in the course of the swing and follow its direction with the club, our eyes still fixed on the spot where the ball was for at least a second after it has been swept away. The finish of the stroke finds us in the position seen in the picture, with the right shoulder swung completely round and pointing in the direction in which the ball has travelled, and the club laid flat across our shoulders. The club, during the full swing of the drive, describes an almost complete circle.

In playing the approach shot, or shots, with cleek or mashie, the same principles of keeping the eye on the ball and the same backward and forward swing are employed, the latter, however, in a less degree, the club being carried up only as far as the shoulder instead of high behind the head, in a half or three-quarter circle only.

Taylor, the famous golf champion, impresses strongly on all his young pupils that the whole energies of the player must be concentrated on the stroke being played, and not wasted in worrying about past bad strokes. The situation must be thoroughly thought out before each stroke is taken, and a plan of campaign should be decided upon when a ball has to be got out of a bunker.

The ball having reached the green, the position in which the putter is to be held is a matter to be left almost entirely to the discretion of the player. Caution and steady play cannot be too strongly recommended when on the putting-green, and we should never attempt to hole out in one shot unless the distance be a very short one.

The etiquette of golf is very strict, and the following rules must be carefully obeyed:

A player going round the links alone must always give way to a properly constituted match. No player, onlooker, or caddie should move or talk during a stroke. Players looking for a lost ball must allow other players coming up behind to pass them. Turf cut or displaced by a stroke must be replaced in position at once. No player should play from the tee until the party in front has played the second strokes and is out of range, and we must never play up to the putting-green until the party in front has holed out and moved away.

Among the most important rules of the game of golf are the following:

When the balls are in play the ball farthest from the hole which the players are approaching shall be played first, each player keeping his own score, except in a match, when each player keeps his opponent's score. The ball must be struck fairly, not pushed, spooned, or scraped, under penalty of the loss of the hole. A ball must be played wherever it lies, or the hole must be given up; any *loose* stones or earth within a club's length of the ball may be removed, but the player may not move, bend, or break anything fixed or growing near the ball. Loose obstructions may be removed from any part of the putting-green. A ball shall be considered lost if not found within five minutes after the search for it is begun. If a ball is lost the player loses the hole.

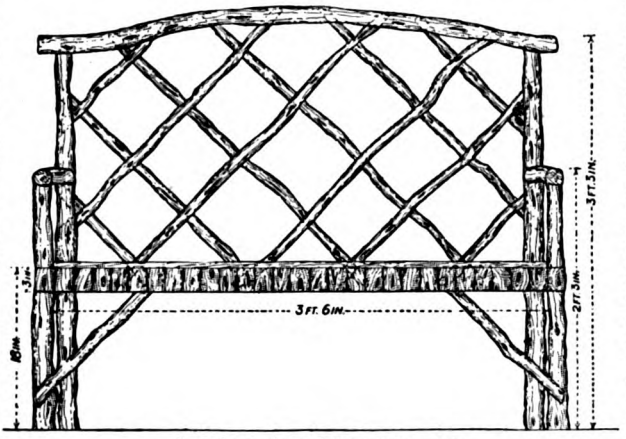
A SERVIETTE-HOLDER MADE FROM CURTAIN-RINGS

A DAINTY and ingenious little serviette-ring can be made in the following way. We get eight brass curtain-rings measuring about one inch across, a crochet-hook, a ball of brighteye or lustrine, and about three-quarters of a yard of silk ribbon, just wide enough to pass through the rings without crumpling. The colour of the thread should match that of the silk. The brass rings are first covered with the thread by crocheting over them. We first make a loop, then put the hook through the ring to make "an over," and then on the outside of the ring make an over, and draw this through the two loops already formed. When the ring is covered, and a neat, even chain shows round the outer rim, we draw the thread once through the last loop, pull it tight, cut it off, and work the end in and out with the hook so that it cannot come loose. We then lay the eight rings in a row, overlapping each other, and pass the ribbon through the second ring as it lies under the edge of the first one. Next we bring the ribbon over the edge of the first ring, and thread it through the third ring, as it lies partly under the second one. The picture shows how this threading is done. The ribbon comes out over one side of a ring after dipping under the opposite side. Having brought the ribbon through the last ring, we tie the two ends neatly in a bow. The ribbon may be quite thin, but it is well to get one with a corded edge, because it wears better.

The serviette-ring

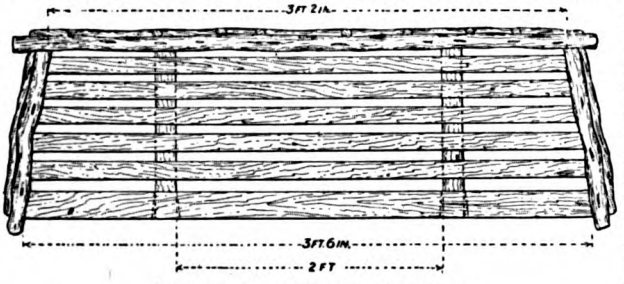
MAKING A GARDEN SEAT

A GARDEN seat is an object that can be made indoors at any time, in readiness for summer use on lawn or garden. It is very easily made and affords scope for various pretty designs, especially in rustic work, the materials for which can be obtained at the woodcutters' sheds where faggots and brushwood are sold. A pretty seat may also be made wholly of *slats*, or thin strips, on a framework of wood or of iron. Out of several designs one is selected and illustrated in this article.



1. A front view of the garden seat

Pictures 1, 2, and 3 illustrate a seat in which rustic work is combined with a square framing. Picture 1 is a view looking from the front, picture 2 shows it as one looks down upon it from above, and picture 3 is an end view. This style of seat is selected because it is easier to make than one in which the framing is built of crooked pieces of timber. With squared wood one has no difficulty in getting the essential framing level, square, and strong, and we would have difficulty should we attempt to mortise and tenon or nail pieces of wood of all shapes together.



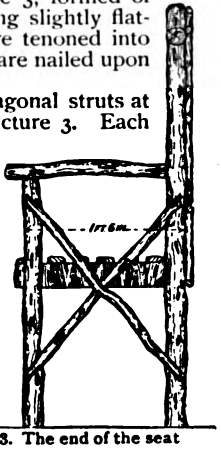
2. The garden seat as seen from above

For the framing, which is seen in picture 4, we buy what is termed *quartering*, measuring 3 inches deep by 2 inches wide in cross section, which saves us the trouble of sawing it out of planks. We smooth it over with a plane and cut off lengths as shown, which, of course, we may make longer or shorter as we please. The method of fitting only is important. There are two sides, two ends, and two middle stretchers.

The framing for the seat has to be fitted to four uprights, which can be made of quartering or of fir-pole, as shown in the pictures. The fitting of these must be good, or the seat will be unsteady. At 18 inches from the bottom, flat faces will be cut on the uprights at right angles with each other, and on these mortises will be marked and cut, as shown in picture 4. Tenons will be cut on the ends of the seat quarterings to fit these mortises very tightly. The end of each tenon will terminate at an angle of 45 degrees, termed a mitre. These ends will abut within the legs, and this abutting contributes very much to the steadiness of the fitting. The legs of kitchen tables are fitted in exactly the same way. After being fitted, the tenons and mortises are well brushed with white-lead paint, driven in tightly and well screwed or nailed. Previous to this the central stretchers will have been fitted into place and wedged as shown. This completes the only troublesome part of the work. The remainder can be made of rustic material in any way we may desire.

Two pairs of sloping pieces or angle-struts are shown supporting the middle part of the seat in picture 1. These are nailed to the front and back pieces of quartering and to the legs. Elbow-rests, as seen in picture 3, formed of round poles, each being slightly flattened on one side, are tenoned into the back uprights and are nailed upon the front ones.

We must also fit diagonal struts at the ends, as seen in picture 3. Each resists the pressure coming from a direction opposite to its own, and thus renders the seat as steady as a rock. They are made of rustic branches cut to angles of 45 degrees at the ends, and nailed or screwed, preferably the latter, to the legs.

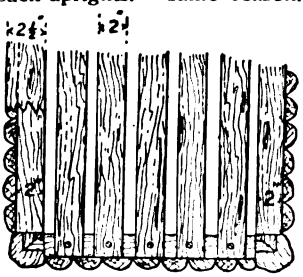


3. The end of the seat

The back can be made of a crooked

branch, not necessarily of the shape shown, and nailed or tenoned to the back uprights. It will be stiffened by the crossing rustic work at the back, the appearance of which may not be just like the drawing, but will depend on the shapes of the material which we can procure. These may be nailed or screwed, but screwing always makes a firmer job.

The seat is made of six slats of ½-inch or ¾-inch board, which may be purchased cheaply at the sawmill, or they can be sawn out of matchboarding. Oak is best, but pine will do. They are nailed with openings between to allow the rain to run away, and are slightly rounded on the top for the same reason. Here the essential work of the seat is finished. But its rustic appearance may be much improved by nailing short lengths of half-rounds all around the edges of the quartering, as shown. They will extend from the top of the slats to about 1 inch below the quartering. Or if straight pieces of half-round branches can be procured, these can be used, one in front, one at back, and one at each end. They are less troublesome to fit than the smaller upright pieces.



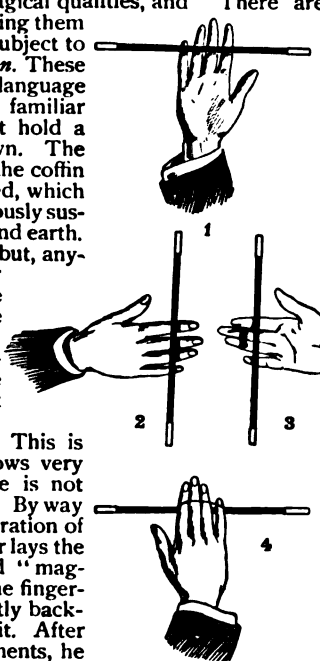
4. Framing of the seat

The whole seat may be painted, but a clear varnish, applied with a brush, is preferable.

THE SELF-SUSPENDING WAND

THE young conjurer has seen on page 3068 how to make a magic wand and to produce it, in a magical way, from his purse. But it may not always be convenient to do this. He may not have the right sort of purse, or his purse may be so full, say, at Christmas time, as to leave no room for the wand. In such a case he may be glad to be able to give some other proof of its magical qualities, and one very good way of proving them is to show that it is not subject to the *attraction of gravitation*. These are big words, but in plain language they merely indicate the familiar truth that, if you do not hold a thing up, it will fall down. The only known exception is the coffin of the Prophet Mohammed, which was said to hang, miraculously suspended, between heaven and earth. Even that tale is not true; but, anyhow, the young conjurer can work a similar miracle on a humble scale with the aid of his magic wand.

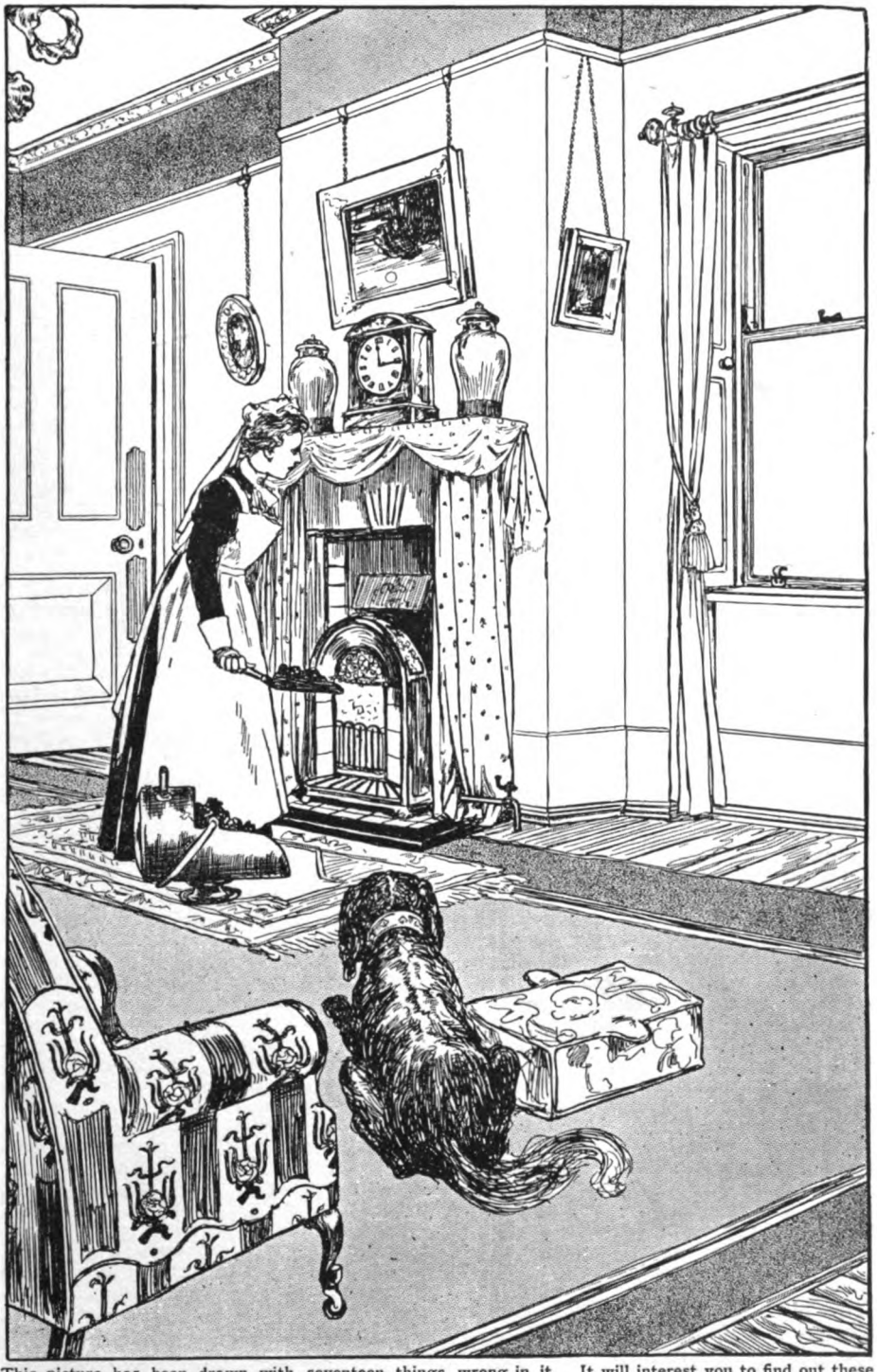
A good way of introducing the trick is to make a few remarks about what is called "animal magnetism," or mesmerism. This is a subject that nobody knows very much about, so that one is not likely to be contradicted. By way of giving a practical illustration of his miracles, the performer lays the wand upon the table and "magnetises" it by drawing the fingertips of the right hand lightly backwards and forwards along it. After doing this for a few moments, he raises the hand. The wand comes with it, as shown in the first picture, as if held up by some magnetic force. He waves the hand about, but the wand does not fall.



Using the wand

Tilting it into an upright position, as shown in picture 3, he removes the second and third fingers, leaving it in contact with the fore and little fingers only. Thence he transfers it to the left hand, and, to make the matter still more surprising, shows that it will hang just as well from the backs of the fingers, as shown in picture 2. After a minute or two he pretends to feel that the magnetic influence is getting weaker, and presently the wand falls to the ground. He picks it up and offers it for examination, but the closest inspection fails to discover anything to account for its very surprising behaviour. There are various ways of working the trick, but for the production of the effects described, nothing more is needed than a bit of black silk thread, about seven inches long. Each of the ends must be formed into a loop, of such a size as to slip easily over the wand. The length of the silk between the two loops should be about four inches; the exact length most suitable will depend upon the size of the performer's hand, and must be ascertained by experiment. To prepare the wand for use, the two loops are passed over it and drawn apart, the intermediate portion of the thread lying straight along it at the centre. Under cover of the pretended magnetising, the performer brings the two loops a little nearer together. This makes a space between the wand and the thread, and presently he works the fingers of the right hand under the thread, as shown in picture 4. This done, all the rest is easy. At the close he has only to draw the wand through the hand, thereby sliding off the thread, which may be allowed to drop on the floor. At a distance of three or four feet the thread, by artificial light, is quite invisible. The performer must, however, always take care to keep the two loops on the black portion of the wand, and the back of the hand turned away from the spectators.

WHAT IS WRONG IN THIS ROOM?



This picture has been drawn with seventeen things wrong in it. It will interest you to find out these mistakes and write them down, comparing your list with the correct list appearing on page 3285.

A LITTLE VEGETABLE GARDEN

WHAT TO SOW AT THE END OF APRIL

OUR chief concern must still be seed sowing, and something that is very useful to grow, and does not need much space, is parsley. Parsley should have a deep, well-worked root-run, and the seed should be thinly sown. It does not come up quickly, therefore it may need watering if the soil gets very dry.

What herbs shall we grow? First and foremost there may be thyme — sweet smelling, and always in request in the kitchen. It flourishes in a warm, sunny position. Sage may also find a place, and is sure to be wanted when ducks are to be cooked and stuffed. We shall not require many plants of this, as they grow to a large size, and one will supply many twigs.

Another useful herb is mint, or peppermint, and here, too, a couple or three well-grown plants will, in all likelihood, be found sufficient.

Some of us may want to grow potatoes. One of the first questions as to their cultivation, naturally, is: When should they be planted? The planting season for this vegetable is a long one. Roughly speaking, in different parts of the country it extends from March until May. Much depends upon the kinds of potatoes grown, and it may be said that those potatoes that are to be eaten as new potatoes, which are dug from the ground as they are required, may be planted earlier than is necessary for those that are to occupy the ground until autumn, when they are dug up and stored for winter use. On the whole, the potatoes that are dug up early, the new potatoes, will be the more convenient for our little gardens, because they occupy the ground for a much shorter period. Generally speaking, in all districts these should be planted by the end of March, but the fear of frost cutting the tops when they have appeared through the ground makes it necessary to plant according to weather and district. The main crop of potatoes may be planted now or later; good crops have even been grown from tubers put in as late as June.

Now comes another question: How deep shall we put them in? This is a question on which there are many opinions, some say three or four inches, others say five at least; and each row must be a foot and a half to two feet apart, those grown as new potatoes the first-mentioned distance or even a little less, and the tubers themselves about eight inches from each other in the rows for new potatoes, and a foot at least if for late ones.

We must not forget our potatoes in frosty weather when they have peeped through the ground, for the young shoots are decidedly tender; if there are but a few plants, it may be possible to arch them over with sticks, and throw some sacking over on frosty nights. But if the frost should catch them, it is an excellent plan to be before the sun and sprinkle them with cold water, but it is of little use to do this if the sunshine has already reached them.

There is another hint that must be given here. When the plants are well above the ground, and have made a few inches of growth, we may carefully bank the soil up around them on both sides.

Some of us will, no doubt, wish to grow rhubarb. We have to remember that when in full summer growth it requires ample space; all the same, it is a profitable and highly satisfactory crop to grow, and the plant is a bold, handsome one. Young plants may be put in during April, and the sooner the better. If dry weather follows the planting, a good watering should be given occasionally. String (or snap) beans, may be planted if the weather is warm. They should be placed several inches deep, and a foot apart, for the bushes of the dwarf or "bush" varieties grow strongly; beets and carrots and oyster plant may go in, too, in long, shallow drills covered lightly, but pressed firmly into the soil with a board, and we must be careful not to pull out the seedlings of the last plant, thinking that they are grass blades, for they closely resemble upshooting grass. Second plantings of peas may follow, and also lettuce. Then the early varieties of sweet corn or maize must now be sown. These are generally dwarf, and the grains may be planted rather sparsely, and rather deeply in long rows. Or they may be grown in hills, four or five grains being dropped in each hole, and the hills at least a foot apart.

So far celery has only been mentioned, but to grow celery may indeed be the ambition of some young readers. For an early crop the seed is sown in a greenhouse or on a hot-bed, but as young gardeners often have to dispense with these, it is the later celery crop that we must attempt. The seed may be sown out of doors now, on good ground which has been deeply dug and manured. We must watch the seed carefully, and when the seedlings appear not let them suffer for lack of moisture. The great secret of having a good crop is to keep the plants always growing, they must not stand still, as it were, and it is very necessary to keep them clear of weeds. Later on there is transplanting to trenches, then, still later, an operation known as *earthing up*, and we must remember that it is a little difficult to grow this crop really well — all the more credit if we succeed.

THE NEXT THINGS TO MAKE AND DO ARE ON PAGE 3278

A FIRST TALK ABOUT TREES

THE VOICE OF THE FOREST

CONTINUED FROM 3103

IF you look long enough at anything in Nature, you will find that it is a world packed with enchantment. Shakespeare says that a quiet life

Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

A foolish fellow, hearing this quotation, exclaimed:

"Nonsense! Books in brooks, sermons in stones! Absurd! What he meant was, Sermons in books, and stones in the running brooks."

Another poet, describing a stupid person, hit him off in these lines:

A primrose by a river's brim
A yellow primrose was to him,
And it was nothing more.

To a person who does not look long enough, there are no books in the running brooks, no sermons in stones, and a primrose by a river's brim is a yellow primrose and nothing more.

An old woman, seeing one of Turner's beautiful pictures, said scoffingly:

"I never saw a sunset like that!"

"No, ma'am," answered the painter, who was standing near, "and you never will."

Some people cannot see anything properly because they have not trained their eyes to see.

Look for a long time at a tree, and see what it will teach you. It is more than a tree. It is more than trunk and branch and leaf. It is a great poet, a great teacher, a great servant. Think for one moment of the silence of a great forest. You know what a tremendous noise comes from our factories and workshops and engine-sheds; compare that stir and clamour with the abiding quiet of a forest. And yet the work of the forest is, perhaps, the most important work that is done on the earth, and is something which man cannot imitate even in the very smallest degree.

In silence, in perfect stillness, the beautiful leaves of a tree drink from the air, and sweeten the twig, the branch, the great trunk, and the spreading roots deep under the earth, with the invisible nourishment of the air.

This work is part of Nature's marvellous chemistry. The leaf takes from the air its richest food, and from the sun its most valuable property, and in silence changes them into things without which our life could not exist. The death of a leaf means bread for the table, fodder for the cattle, and perfume for the rose. The death of a tree means speed for the railway engine, heat for our houses, and light for our cities. The two supreme things in existence on the earth, fire and food, come from the leaf of a tree.

There are few sights in Nature more striking than the fall of the leaf in

autumn. Look at this lovely wood, where we came in summer, and, resting on the mossy bank beneath oak and elm, held our picnic, listened to the song of the birds in the branches, and saw the shafts of sunlight glimmering through bright leaves. The mossy bank is soaking wet, the leaves have become red and brown and russet, a heavy scent breathes on the damp air, and as we stand listening, we hear on every side the steady, ceaseless fall of leaves.

THE FRESH LIFE THAT THE FALLING LEAVES CARRY TO THE EARTH

Dead leaves? No; they are still carrying on their beautiful work. Down from the branch where they protected flowers from the scorching heat of the summer sun and hid from their enemies the happy housekeeping of birds and squirrels, down from the branch which they fed with life, these leaves fall with fresh life to the earth.

Look round the room where you sit. The chair in which you rest, the floor on which the chair stands, the frame of the window through which you see, the laths of the walls which keep you protected from the cold, the very paper on which you read what is now being written with the aid of a wooden penholder, all these things came from the tree that was once in the forest. And what is the origin of the tree?

An acorn—something that a new-born infant can hold in its tiny hand—may contain an oak-tree, and not only one oak-tree, but millions of oak-trees—enough to build a fleet of ships, a Spanish Armada, a city as large as Chicago. In every seed of a tree there is a forest. A little bird setting its exquisite claw on a tiny seed, and pressing it into damp earth, or letting fall one of these tiny seeds as it flies through the air, or shaking down one of these seeds as it perches on a twig, releases the spirit of life and brings a forest into existence.

THE WONDERFUL LIFE THAT IS CONCEALED WITHIN A TINY SEED

The seed of a tree is something quite small and insignificant. There are some of these seeds so small, and so exactly like the seed of many little plants, that even the microscope reveals no difference between them. But these little seeds, bursting in the darkness of the earth, and putting out tiny threads which push their way through the heavy soil, become in time gigantic trees, out of which man gets his wood for building, his manure for flowers, and his heat for furnace, railway engine, and factory.

Our bookshelf was, perhaps, a tiny seed which a robin, fed by St. Francis of Assisi, trod into the earth. Our chair was, perhaps, an acorn which, falling from its branch, struck the shoulder of Robin Hood. The pencil with which we draw horses and the little houses with smoke coming from every chimney is, perhaps, descended from one of the cedars which built King Solomon's temples.

The fire at which we scorch our faces when making toast was, perhaps, a tree under which Lincoln rested from the heat of the sun. There may be in our room, in our pocket, as there must be in many places all over the world, some manufactured article which once lay concealed in the tree on which our Saviour suffered death for mankind.

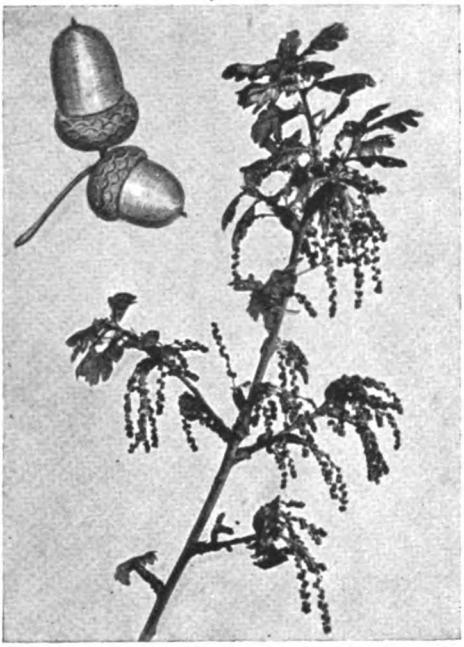
THE WONDER OF ETERNITY IN THE LITTLE GREEN TREE

There are tongues in trees if we have ears to hear. They tell us of Nature's magic provision, whereby, out of the invisible air and through the gorgeous gates of autumn, death passes for ever the gold and scarlet pageantry of life. A leaf does not die—it passes into fresh existence. The scent of the violet and the yellow of the primrose are the risen spirit of the leaf we call dead.

And the tongues of trees tell us of the history of the world. Not a little soot-grimed shrub in a Pittsburgh suburb garden but had its origin millions of years before ever a man opened his eyes on the earth. Man traces his ancestry into the past, gets back a few pitiful hundred years, and calls it his "family tree." The true family tree is every bush that grows, every little sapling that strikes roots into the earth and lifts its tender leaves to heaven. From eternity, that little green thing has come; it is a traveller that has been journeying millions of years longer than man, for it existed in the first seed, and through trees uncountable, thousands and tens of thousands, it has been making its way down to us who are living in this twentieth century.

FOR FURTHER TALKS ABOUT TREES SEE INDEX, AND FOR THE NEXT FAMILIAR THINGS SEE PAGE 3181

THE OAK, THE HERCULES OF THE FOREST

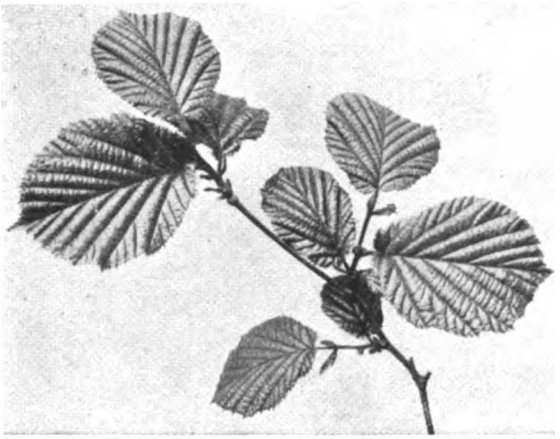


The green tassels we see on oak-trees are the male flowers, but it is from the smaller female flowers that acorns come. Our forefathers used to eat acorns.

We all know the wavy leaves of the oak, which are more attacked by insects than those of any other tree. Over 1,500 different kinds of insects feed upon the oak.

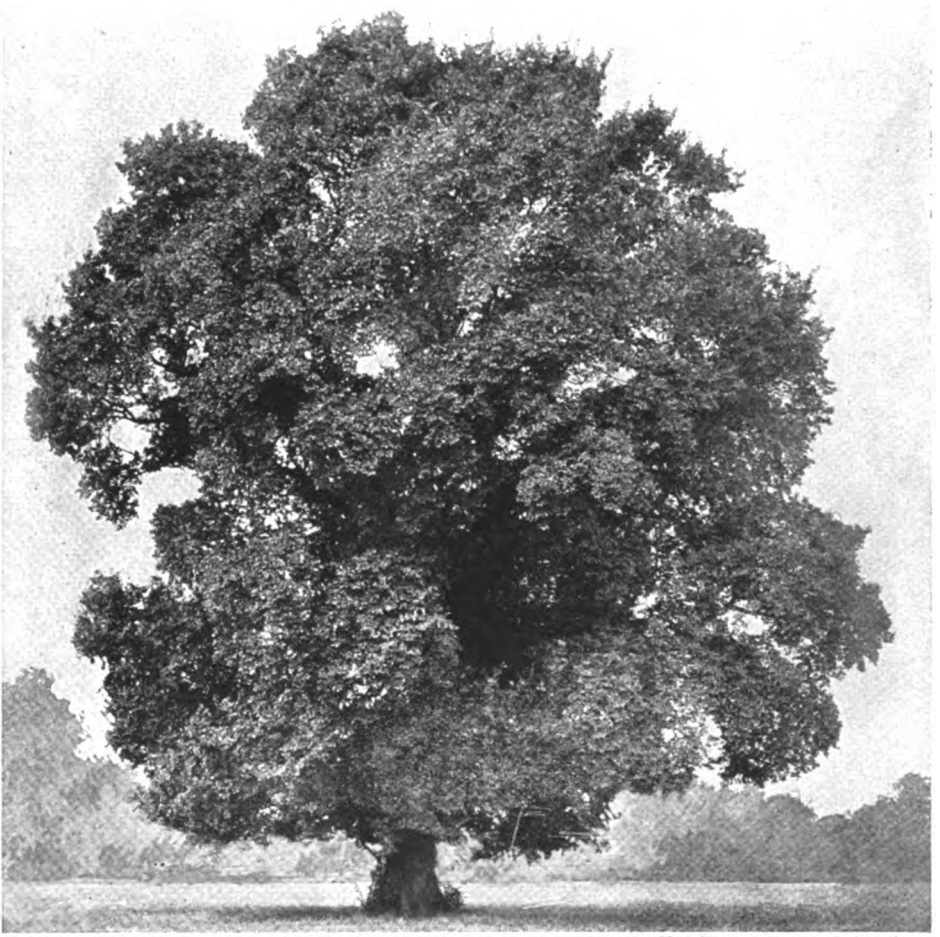
There are nearly 300 different kinds of oaks, and their leaves are all kinds of shapes. But the common oak, shown here, is the best known, and its title—"the Hercules of the forest"—is well merited, for it stands as firm as a **rock. It lives 1,500 years, and the wood and bark of a single tree realise $100. Our warships used to be built of oak.**

THE TALL AND STATELY ELM-TREE



The leaves of the elm are covered with little hairs, which get into our skin and sting like the nettle, though less severely. The elm is related to the nettle.

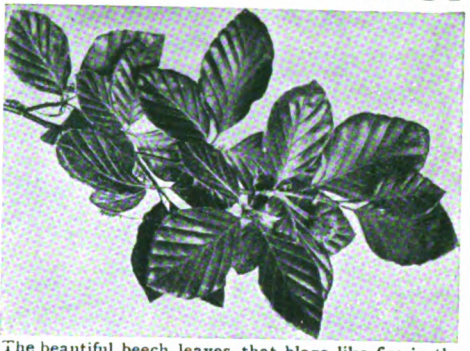
The elm flowers grow, not in catkins, but in little dark red tufts.



Even the oak is not a more typically English tree than the stately elm. At Horsham, in England, there is an elm which measures 61 feet round the trunk, and a dozen persons have sat down to a banquet in the hollow trunk. Many of the tallest and most stately elms in our Eastern cities are English.

THE BEECH, THE MOTHER OF THE FOREST

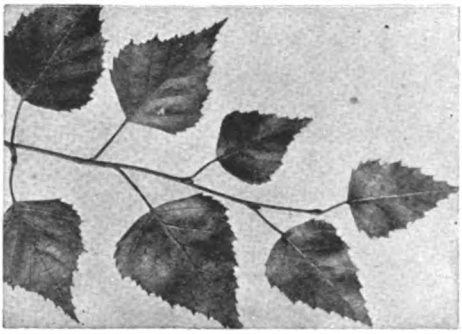
The flowers of the beech are like little tassels on the ends of strings, and the fruit is used as food for pigs.



The beautiful beech leaves, that blaze like fire in the autumn sun, were formerly much used for stuffing beds.

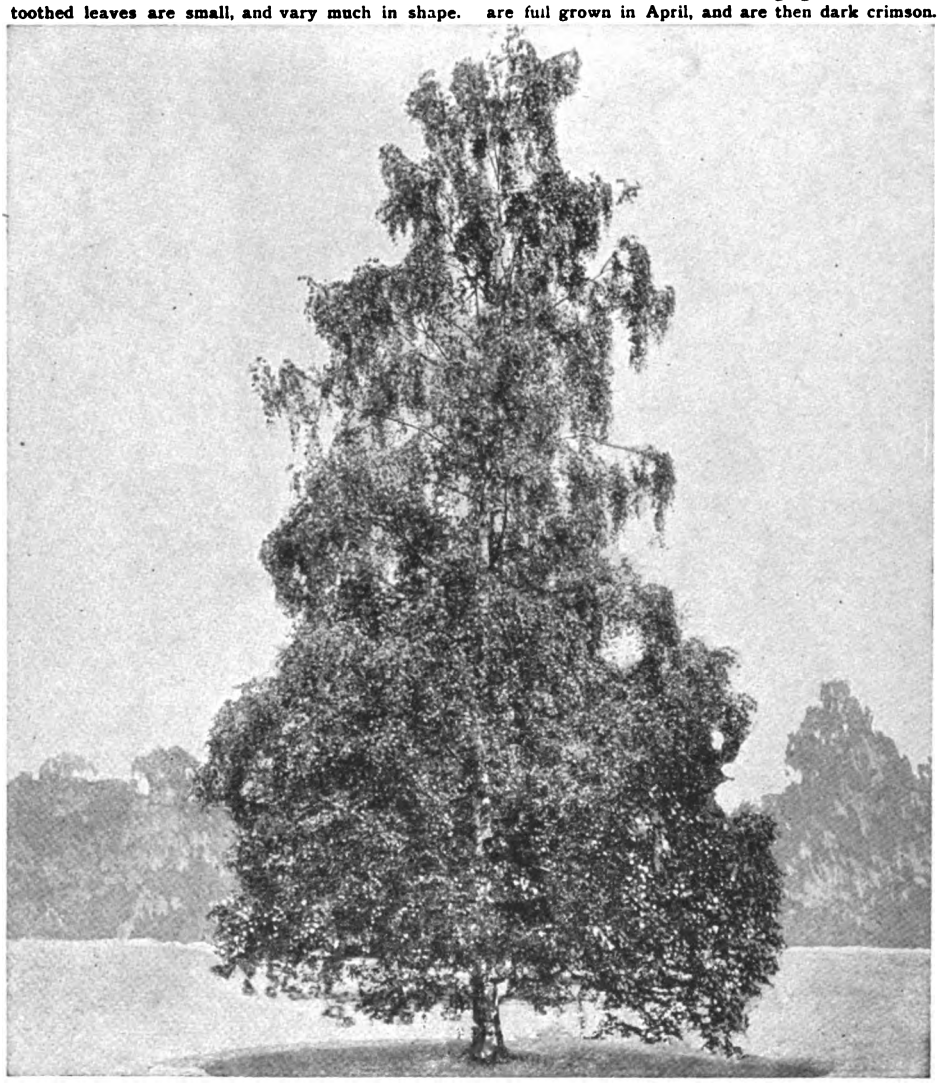
Although the beech itself is of little use for timber, an expert has declared that without the beech we could not grow our most valuable timber trees, as the beech protects these from cold winds when they are young. From this fact the beech has been given the name of "the mother of the forest." If, however, a forest be planted with beeches and oaks, and left to itself, the beeches will, in course of time, crowd out and kill the oaks.

THE BIRCH, THE LADY OF THE WOODS



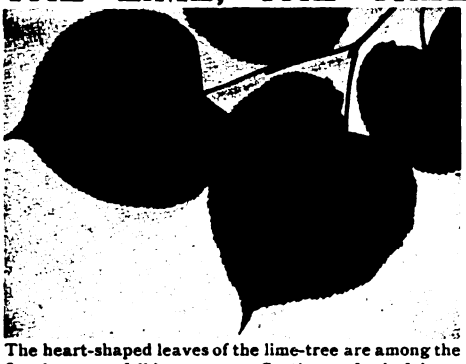
The birch is one of our most common forest trees. Its toothed leaves are small, and vary much in shape.

The flowers are in the form of hanging catkins, which are full grown in April, and are then dark crimson.

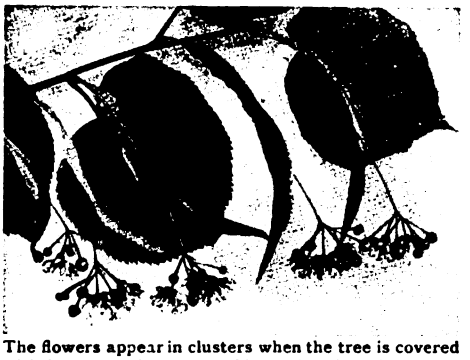


The birch is equally happy in a city park and on a lofty mountain, and it thrives in extreme heat or extreme cold. From its graceful appearance, it has been called "the lady of the woods." Every lad knows the use to which the twigs used to be put in British schools where "birching" a boy still means whipping him.

THE LIME, THE TREE OF THE HONEY-BEE



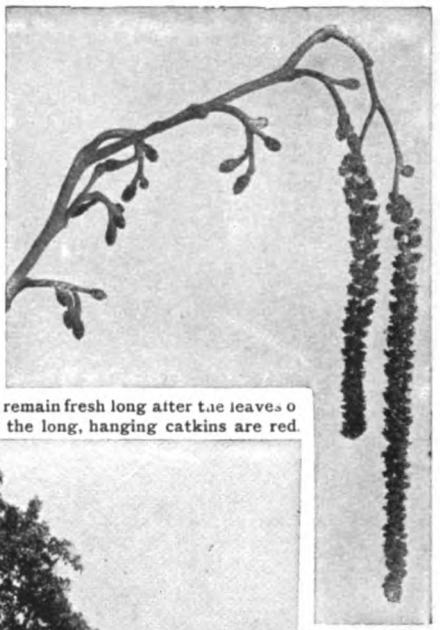
The heart-shaped leaves of the lime-tree are among the first leaves to fall in autumn. Cattle are fond of them.



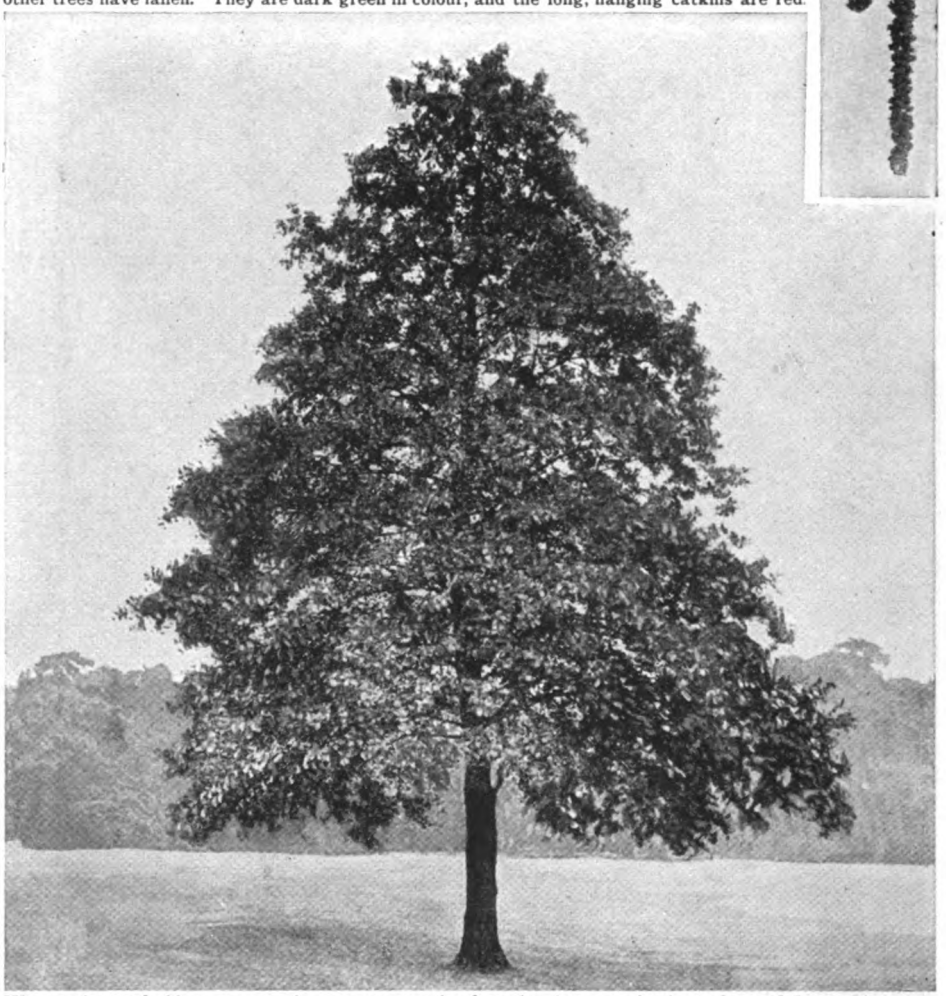
The flowers appear in clusters when the tree is covered with leaves, and swarms of bees visit them for honey.

We scarcely recognise in this handsome tree the lime, or linden, of our town gardens, where it is usually ruined and dwarfed by constant cutting. But in a meadow or park the lime grows to be a fine tree, 80 or 90 feet high. Most of the historic carvings in old London churches are in lime wood. In olden times shields used to be made of lime wood.

THE ALDER, THE TREE OF THE RIVERSIDE

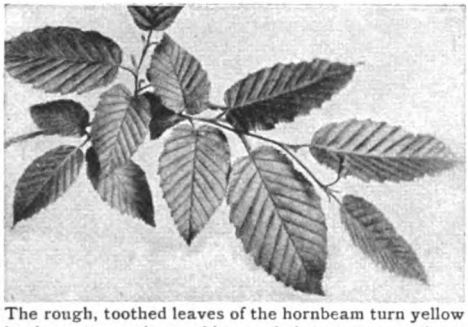


The leaves of the alder, which are rather sticky to the touch, remain fresh long after the leaves o other trees have fallen. They are dark green in colour, and the long, hanging catkins are red.

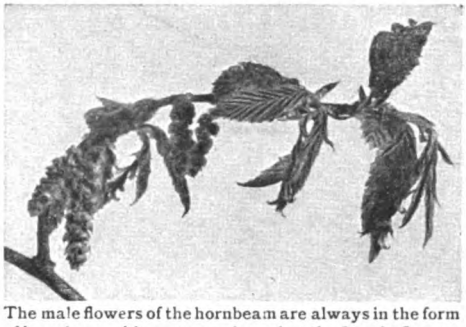


We see plenty of alder-trees growing near gunpowder factories, because the best charcoal for making gunpowder is obtained from alder wood. This wood is also very valuable for all purposes where timber is to remain under water, as in piers; and for this reason the French make their wooden shoes, called sabots, of alder. Alders flourish in moist places, such as the banks of a river. Dyed black, alder wood is an excellent imitation of ebony.

THE HARD HORNBEAM OF THE FOREST



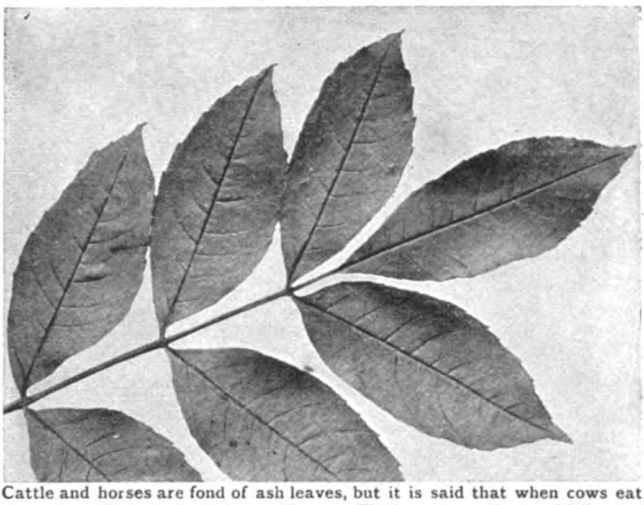
The rough, toothed leaves of the hornbeam turn yellow in the autumn, then golden, and then a rusty red, remaining on the branches of the tree through the winter.



The male flowers of the hornbeam are always in the form of hanging catkins, as seen here, but the female flowers grow upright, and only droop when the fruit forms.

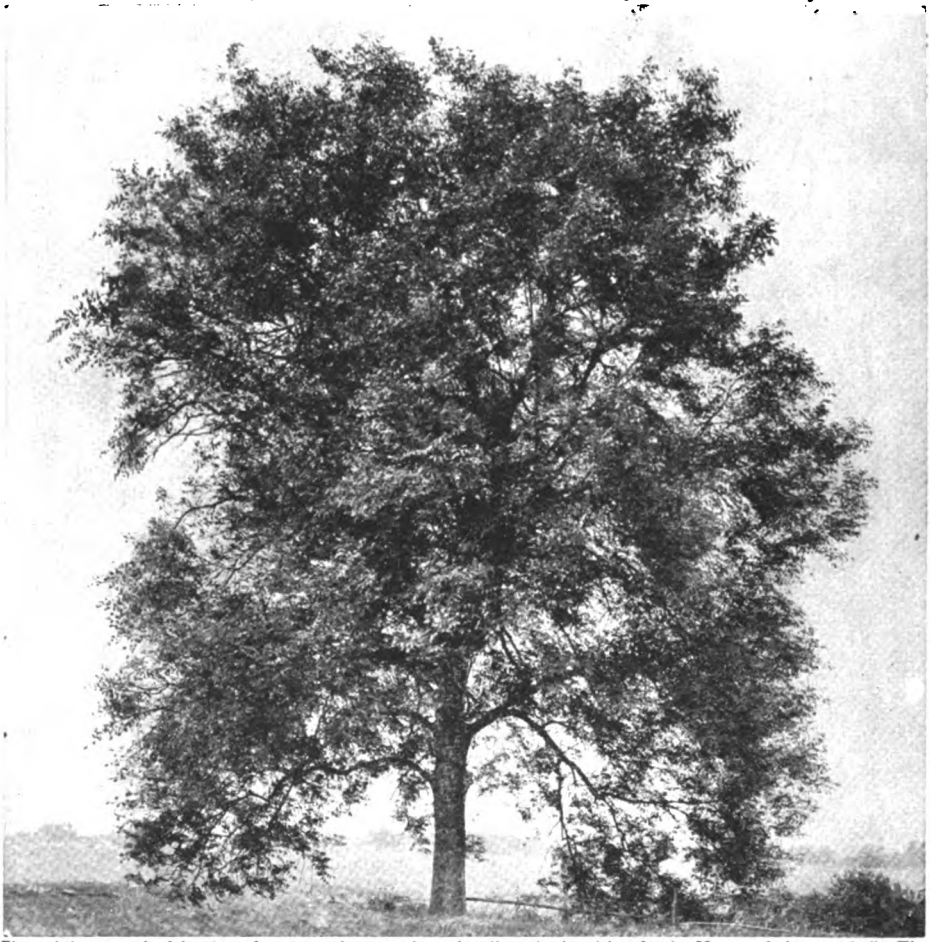
The hornbeam is a common tree in our woods, but many people who see it there mistake it for the beech, because of a certain resemblance in the outline. As a matter of fact, the leaves, the flowers, and the trunk are all quite different from those of the beech. Hornbeam gets its name from the horny toughness of the wood.

THE ASH, THE VENUS OF THE WOODS



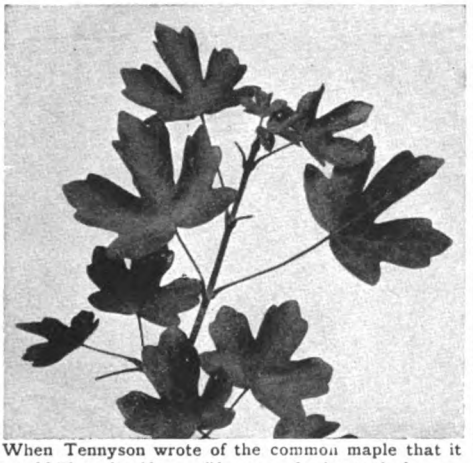
Cattle and horses are fond of ash leaves, but it is said that when cows eat them their milk does not make good butter. The leaves come late and fall early.

The flowers, which appear before the leaves, are very unattractive.



The ash is a wonderful union of grace and strength, and well merits its title of "the Venus of the woods." The roots strike deeply, and so exhaust the soil that nothing can live beneath an ash. Oars are made of its tough wood.

THE COMMON MAPLE OF THE HEDGEROW

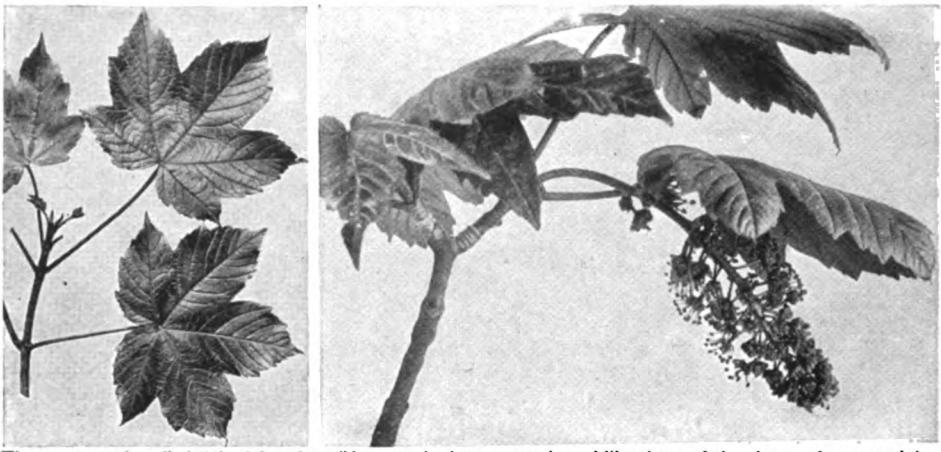


When Tennyson wrote of the common maple that it would "burn itself away," he was referring to the leaves, which change to a rich, blazing yellow in October.

The greenish yellow flowers are quite small, and develop into curious winged seeds, known to country people as "keys." These become crimson and brown as they ripen.

The beauty in form and foliage of the maples, their fine color in autumn, and their rapid growth, make them the favorite shade-tree for streets and lawns; besides this the sugar maple yields us the nutty brown sugar everybody loves, and the wood is excellent for furniture.

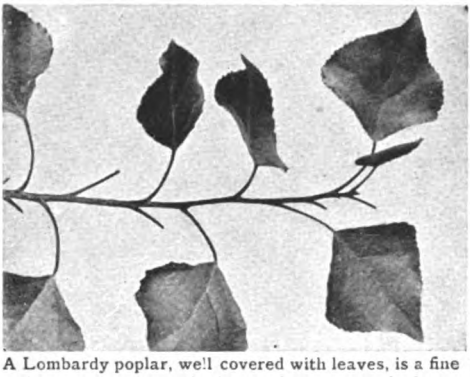
THE SYCAMORE OF THE SEA-COAST



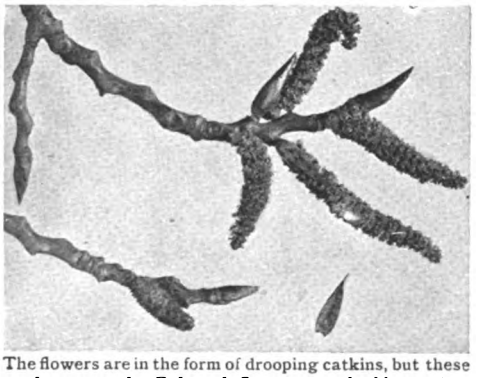
The sycamore is called "the false plane," because its leaves are shaped like those of the plane. A sugary juice comes out of the leaves, and sugar is made from a tree related to the sycamore. The flowers are yellowish green.

The European sycamore is a fine-looking, robust kind of maple which will flourish even on an exposed sea-coast, where the gales and salt air kill all other trees. The tree mentioned under this name in the Bible is really a fig-tree, and the tree we, in the United States, usually call the sycamore is the plane-tree or buttonwood.

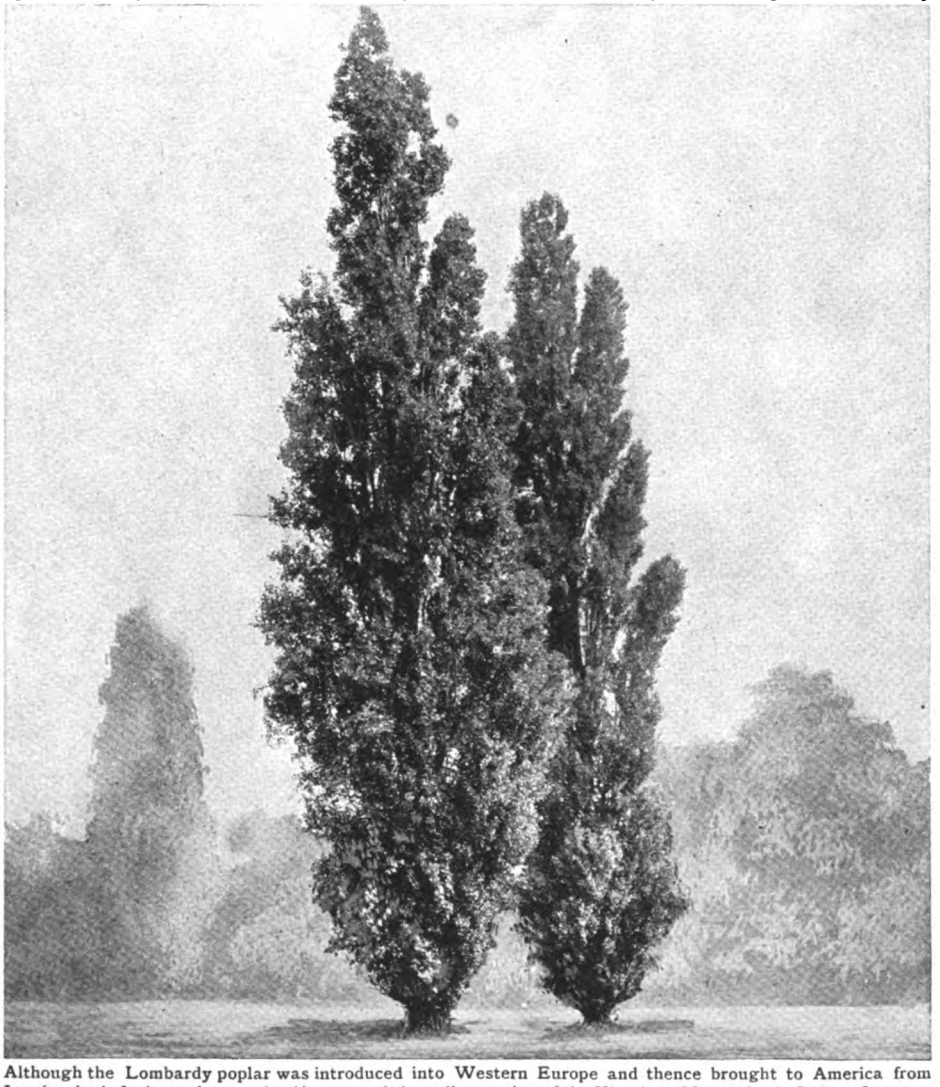
THE POPLAR THAT GROWS LIKE A GIANT



A Lombardy poplar, well covered with leaves, is a fine sight, as it sways in the breeze like an ostrich plume.

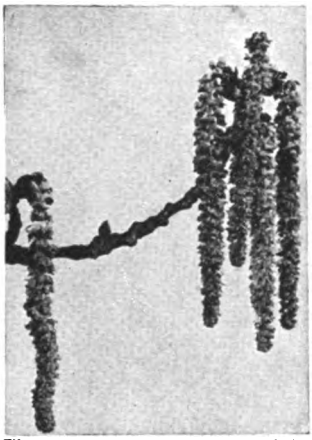


The flowers are in the form of drooping catkins, but these produce no seeds. Only male flowers grow in this country.

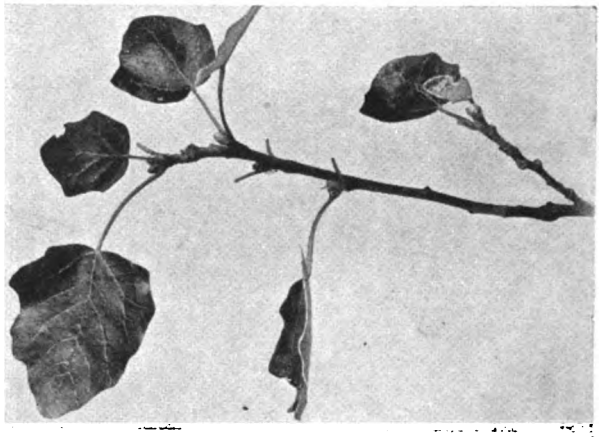


Although the Lombardy poplar was introduced into Western Europe and thence brought to America from Lombardy, in Italy, and so received its name, it is really a native of the Himalaya Mountains in India. It grows very rapidly, and a man who plants a cutting may live to see it become 125 feet high in 50 years.

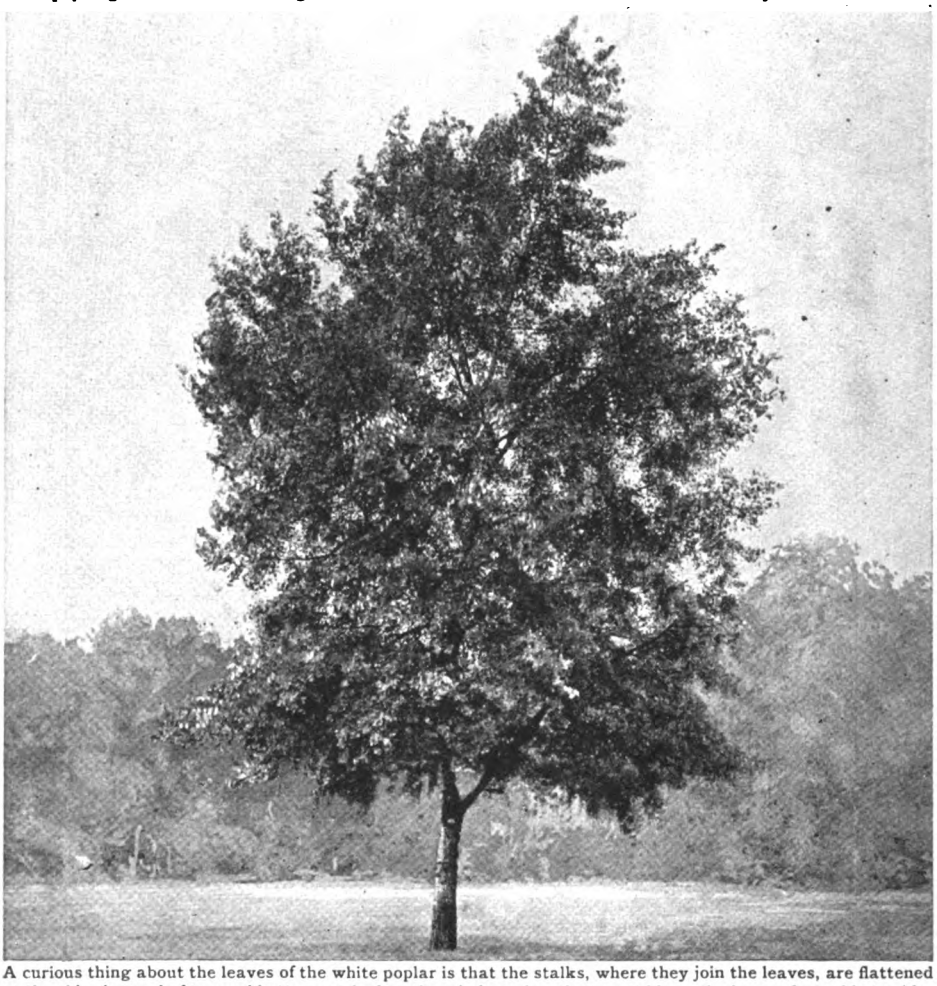
THE WHITE POPLAR WITH SILVERY LEAVES



The handsome purple catkins of the white poplar grow several inches long.

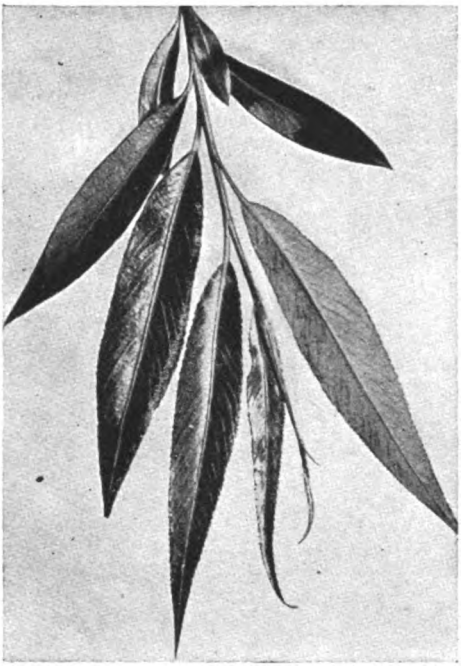


The dark green leaves are very light on the under-side, owing to a kind of down that covers them and makes the tree look silvery white at a distance.

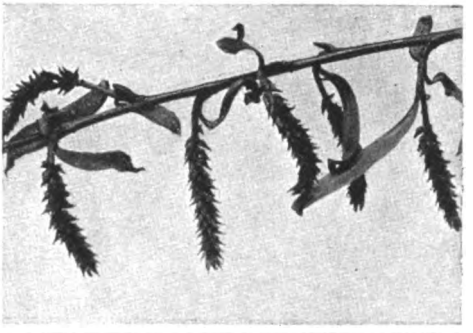


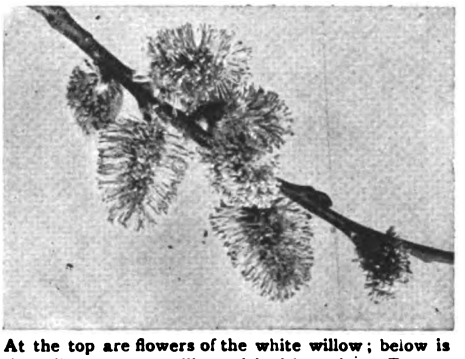
A curious thing about the leaves of the white poplar is that the stalks, where they join the leaves, are flattened at the sides instead of top and bottom, and when the wind catches the tree it blows the leaves from side to side, instead of up and down, as is the case with other trees. The wood of the white poplar does not burn easily.

THE SAD AND SORROWFUL WILLOW-TREE

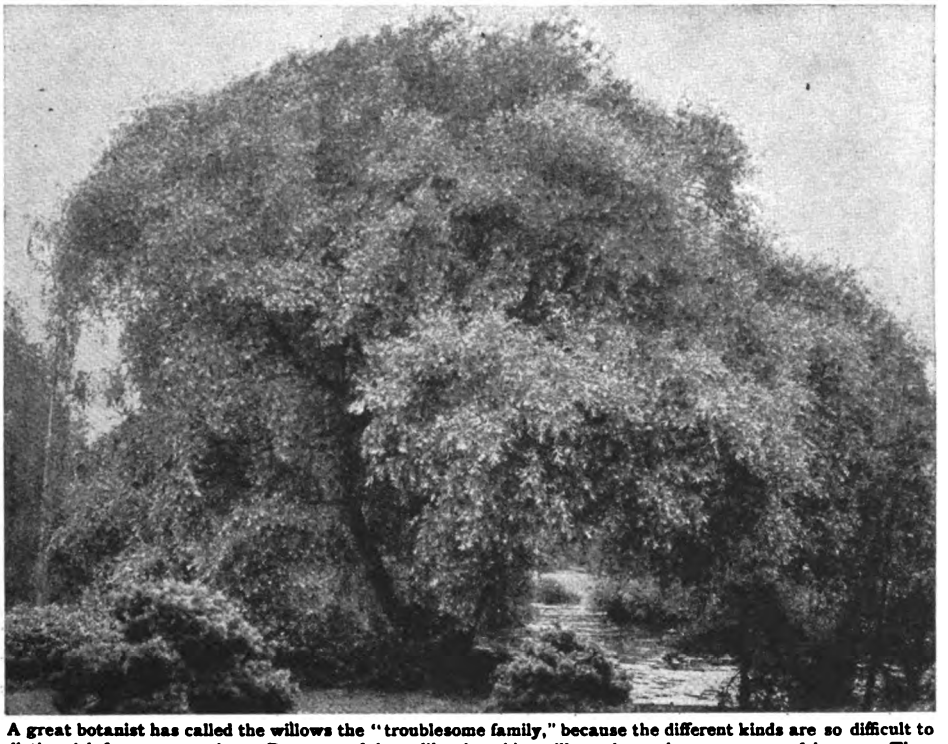


The leaves of the common white willow, like those of most of its relations, are long and lance-shaped.





At the top are flowers of the white willow; below is the sallow, or goat-willow, picked for palm at Easter.



A great botanist has called the willows the "troublesome family," because the different kinds are so difficult to distinguish from one another. But most of them, like the white willow, shown here, are graceful trees. They have, for some reason, become associated with sadness, and one of the family is called the "weeping willow."

THE NEXT FAMILIAR THINGS ARE ON PAGE 3321

A ROADWAY CUT THROUGH A TREE

There are trees that live to be many hundreds of years old; there are trees so huge that a carriage and four horses can drive through them. This is one of them. It is one of the largest trees on the face of the earth, standing in Mariposa Grove, California. It is called the Wawona Tree, and is so enormous that, as this picture shows, a road has been cut through it, and a horse and cart can pass through it with plenty of room to spare. The tree is 28 feet across.

WHAT THIS STORY TELLS US

CHILDREN are considered much more important now than a hundred years ago. This story tells some of the things which one great city is doing to help its children to become strong men and women. The schools are of course important, but we shall see that many things besides instruction are offered to our children; for it is of little use to teach a child who will grow up into a hopeless invalid. Besides the schools, the libraries are one of the most important means of education in the city. The little immigrant children are more eager to get an education than those whose parents were born in the United States.

WHAT NEW YORK CITY DOES FOR ITS CHILDREN

IN our Wonder Book, on page 2873 someone asks the question, "Will children rule the world?" and the Wise Man tells us why it is that the children mean so much to the welfare of a nation. They are the men and women of the future. People did not always think of this. In the days of which we read in our "Little Girls of Long Ago" it was believed that children's wills must be broken, their minds and bodies completely subjected to their parents. A child was merely an unregenerate little being who "must be seen and not heard." Though as dearly loved by his parents as the child of to-day, his welfare was left in their hands and it never even occurred to the community to consider him in making its plans, with the exception of the provision for schools, of course.

THE NEW VIEW OF THE IMPORTANCE OF THE CHILD

To-day the world is awakening to the supreme importance of the child. It is beginning to realise that in the hands of the children will some day rest the government of our nations and the making of our homes, and that if we wish the United States to continue a strong and mighty republic, we must carefully look after the training of our children. New York, Boston, Chicago and many other of our large cities have found that if they would have healthy-minded, wholesome-bodied citizens they must see that the minds and bodies of their little ones are properly cared for — that the children are properly fed, and clothed, properly housed and properly taught, or else the well-being of the child and of the community will suffer. The parents in many cases are too ignorant or too poor to do these things for their children.

New York City, with its ever-changing, ever-growing population of immigrant children, has a particularly hard problem to face, and in many ways its government has responded nobly to the crying need for child training.

WHAT THE PUBLIC SCHOOL DOES FOR THE CHILDREN

It has a system of public schools, which, though perhaps not all that it should be, still accomplishes wonders with the children with whom it has to deal. It takes many of them from dirty, crowded, poverty-stricken tenements of the city — Italian, Russian, Polish, Hungarian, — and undertakes to lay a firm foundation for good citizenship and good home making. The children enter the school with no knowledge of English, accustomed to the squalor and filth of the tenements. In a few years they leave the school, but with what a difference! They have been trained in personal cleanliness, and many have responded to the training; they have learned the language and have a fair knowledge of the land in which they live — and they are proud of their knowledge, proud of

their school, proud of their teachers, and above all proud of the great United States — the country of their adoption.

THINGS STUDIED IN THE SCHOOLS

The public schools of New York try to cover the field of a child's development into citizenship as widely as possible. Besides the subjects usually taught in schools, they provide classes in carpentering for the boys, and cooking classes where the girls learn the real value of simple foods and how to prepare them; they have calisthenic exercises and gymnasiums to make the children's bodies strong and healthy; they have school doctors to inspect the eyes, teeth, noses, and throats of the pupils, and to see that all defective children are properly cared for; and they have nurses to visit the homes of children suffering from illness, and to instruct the parents how to care for the little patients intelligently.

In other ways, too, the public school is doing a fine work. The children of the tenements must begin to earn their living at a very early age. The general intelligence and penmanship of a public school trained child help it to get a start, from which it may rise to success. For ambitious boys and girls there is further training. The great public high schools enroll thousands, and at the top of these are two great colleges, one for boys and the other for girls, where tuition and books are free. Where the child must work there are night schools, where the children may carry on the subjects of the high schools and where stenography, typewriting, bookkeeping and sewing are taught.

PARENTS' ASSOCIATIONS

The public school does not rest content with dealing with the child in the class-room alone — it tries to reach him through his home, and for this purpose it has organised mothers' meetings and parents' associations. At these meetings the parents and teachers talk over the children, and discuss the best methods for bringing them up. The parents' obligation to send the child to school clean is tactfully pointed out. And gradually the parents learn the danger of disease that lurks in uncleanliness. Among other things the harm of promiscuous theatre-going and the damage brought about by cigarettes is brought to the notice of the parents. The mothers are asked to co-operate with the school doctor. Perhaps a trained nurse gives a series of demonstrated talks upon "The Proper Care of Children's Diseases;" and so, bit by bit, the parents come to realise somewhat of their responsibility to their little ones, and the children are immeasurably benefited.

THE LITTLE MOTHER'S LEAGUE

But the grown-up mothers are not the only means by which the little ones are reached. An association has been formed of the older sisters who often have the entire care of the babies, called "The Little Mother's League" and in most cases these "little mothers" are found to be much more amenable to advice than the mothers themselves. One afternoon a week during the summer, the girls of the tenements who are forced to take the younger brothers and sisters, meet in various schoolhouses, where for an hour or more they are given practical talks by doctors and nurses connected with the health department.

"The various prepared baby foods are discussed, and under skilful direction of the nurse the little mothers are allowed to prepare modified milk and to sterilise the bottle. Then one of the babies will be given a model bath; another will have its tiny clothes pinned and adjusted so that it is made as comfortable as possible. After the nurse has shown how these things should be done, the little mothers demonstrate how well they have learned their lesson.

"Emphasis is laid, in all the talks, upon what plenty of fresh air means to the baby, and upon the need of having it in clean surroundings. The little mothers are asked to tell from week to week how their babies have been, and these experience meetings are of the keenest interest."

FROM ELLIS ISLAND TO CITIZENSHIP

From the poor, timid little strangers entering the country through Ellis Island, to these rugged little Americans working away at their garden plots, is quite a step. This is one of the garden blocks in the upper part of New York City, where the children, under trained instructors, learn gardening.

The little immigrant children landing at Ellis Island, the gateway to New York, have their Christmas tree like any other little Americans. Here we see a group of little Italian youngsters proudly displaying the gifts that Santa Claus, in the form of a United States official, has brought them.

How to take care of a baby

That these talks are earnestly devoured and digested by the little mothers was proven by the brief essays they were required to write not very long ago, at the close of a series of lectures.

One little mother wrote thus:—

"Do not dress the baby warm in summer. Put very little clothes on it. The best food for the baby is barley water. When it is sick give it a dose of castor oil. You must nurse the baby according to how old it is. Bathe the baby every day. Sponge it every minute. Do not give it any fruit or grocery milk. Do not give it any apples, or pickles, or watermelon, or any of that kind of stuff, because the baby will die."

Each girl belonging to "The Little Mother's League" wears a badge as a token of membership; and the president of each group wears a gilt badge which is looked upon as a mark of high honour. These little mothers are in most cases from six to fourteen years old, and in most cases have to care for the baby during the day, while the mother is away at work. The elder sisters too are one of the best means of reaching the mothers themselves, who are not always as adaptable as could be wished and often flatly refuse to follow the instructions of the visiting nurses connected with the public schools and the city hospitals.

Visiting nurses and physicians

The city hospitals, and as we have said before, many of the public schools in New York City, have physicians and visiting nurses connected with them, and it is astonishing the downright ignorance and suspicion with which they are met in their efforts to bring the mothers to a proper realisation of their responsibility.

One nurse of wide experience in this work said that while many of the mothers were glad to take whatever assistance might be offered to them, she found it a very difficult, almost impossible, task to make them realise the necessity of cleanliness and of proper regard for food. She cited a case of one family where the child, during one day, had been fed on watermelon, potatoes, pickles, and practically everything else at hand except the milk which should have been its sole diet. In another case the nurse found the baby, a few weeks old, lying in a basket by the side of the stove sucking a piece of cornbeef. "Why did you give the baby cornbeef?" asked the nurse patiently, as she gently unclasped the baby hands from the indigestible morsel.

"Well, and what would you have me give him?" returned the mother crossly. "He don't like pork."

The nurse stated that in some cases the only hope for a sick child's life lay in taking it away, temporarily, from its improper surroundings.

Sea breeze

For such poor, little, sick waifs of the city as these, homes like the Sea Breeze Tuberculosis Hospital and the Home for Sick Babies at New Dorp have been founded.

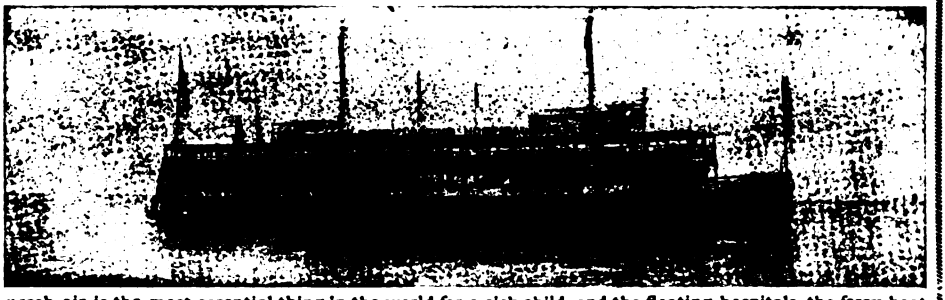
The Sea Breeze home is built upon Coney Island and contains many of the little ones who have been seized with that terrible scourge of ill-nourished childhood, bone tuberculosis. Here hundreds of little cripples from the tenements of New York City, whose lives would be otherwise hopeless, are given a chance in the open on the seashore, summer and winter alike, until the healing forces of nature have done their work.

Mr. Jacob A. Riis introduces us to one or two of the brave little inmates of Sea Breeze in person.

"Here is five year old Max Gross," he writes, "child of poverty and want, all the days of a long and weary year strapped to a frame that holds his little body rigid because his back is not like the other children's. Yet ever cheerful, never hopeless, calling across the room to the doctor, 'I am all better!' Poor little chap! Once and only once, his tears fell; and when his nurse went to him in alarm he sobbed out upon her sleeve that someone had said on the porch as he was carried by, 'Max will not get better.' 'And I don't want to get dead and be an angel,' was the cry that wrung the nurse's heart, 'I want to get off my board and play first!'

FRESH AIR AND FUN FOR THE CHILDREN

Here is a picture of a corner in one of the many roof playgrounds in New York. These roof playgrounds, far above the hurly-burly of the city streets, provide happy, healthful places of amusement for the little children of the slums.



Fresh air is the most essential thing in the world for a sick child, and the floating hospitals, the ferry-boat schools and the seaside homes that New York City and its charitable organisations provide for its suffering little ones, bring health and rosy cheeks to many who would otherwise die.

New York has one of the best organised systems of public playgrounds in the world. Here we see a group of lads under the care of two of the city game teachers Base-ball, basket-ball, tennis, and golf are among the games taught the boys.

"Then here is Madeline Garland, Max's bosom friend. She is seven and her Sea Breeze name is Bumps, supposedly from the big freckles that cover her jolly little face and snub nose. Like Max, she has all her days been strapped to the board that looks so cruel and is so kind, and views the world about her brimming over with joy, her nurse says. Sea Breeze is all the home she has ever known."

All the days are spent in the open at Sea Breeze — even the school is a tent, and very cold weather only shortens the brief school hour.

THE HEALING CAMP ON THE ROOF

But all the little consumptive children of the slums cannot be taken into the seaside homes, so roof camps have been established where the children can spend the days in the open air. The patients arrive at the camp each morning at nine o'clock and are at once given to drink a glass of fresh milk with a raw egg beaten into it. Then the children have their lessons almost as they do at school. At noon a plain, wholesome dinner is served, and in the afternoon another glass of milk with a raw egg is given. Promptly at five o'clock the camp closes, but the unhealthy conditions of the home are not allowed to neutralise the good effects of the open air. "Nurses and physicians visit the tenements and see that the lightest, airiest room is given to the patient. They see that the linen and eating utensils of the patient are washed separately and give tickets for two quarts of fresh milk and three raw eggs a day. The day camp is one of the many wise agencies provided by New York City in the struggle against the great White Plague."

PLAYGROUNDS IN THE AIR

But after all it has been found that the real hope of the city lies in the healthy children, and the government has set itself to the task of keeping them robust and happy, and providing them with wholesome employment for their brains and bodies. For this purpose it has established open air playgrounds, roof gardens, recreation piers, bathing pools, garden plots, and athletic grounds and has secured jolly, wholesome young women and men to teach the children how to play.

The settlement workers among the children of the slums count the roof gardens as one of their most valuable helps. All the newer public school buildings in New York are built with roof playgrounds, enclosed with wire netting and floored with tile. Here the children learn baseball and basketball and even tennis, and perhaps in the evening there are gymnasium classes and dancing classes.

Many of the model tenements are built with roof gardens, and many of the Day Nurseries of New York City have summer roof gardens, where the little tots left in the care of the nurses can play in the open air until that best of medicines begins to bring back the pink glow of health to their pale cheeks. On the roof gardens the children find swings and hammocks and shoot the chutes, and flowering plants for whose growth and care they are sometimes made responsible.

THE PUBLIC PLAYGROUNDS

Then there are the playgrounds where a fellow can play ball just as much as he likes without being taken up by the "cop," where there are swings and rings and bars and trapezes and tennis courts and sand piles, and other delights innumerable. From the oldest boy to the littlest of the little folk there is something for all to do — and all this away from the dust and clamor of the heated city streets.

The value of the public parks as playgrounds has also been recognised, and once in a while, New York takes the little girls from the public schools and trains them for a public exhibition of folk-dancing in the parks. What fun the children do have over the dances, and how their little stranger hearts begin to glow with an understanding and pride in their new country! The children have come over the seas from Russia, from Ireland, from Germany, from Poland, from Italy, and everything is so different, when lo and behold,

in the big public school building they find a teacher who teaches them the dances that they have seen danced in their own country. So far as possible each child is taught the dances of its own nationality — the folk-dances of Germany, Scotland, Ireland, Spain, Russia, Italy, Poland, Bohemia, Sweden or Hungary.

The public parks, too, are often the scenes of games by boys and girls in flag drills and other forms of patriotic plays. So the old is linked with the new and the little foreigners at last begin to feel that they are really American citizens.

Recreation Piers

Dancing is taught also at the recreation piers, which have been built at various spots along the Hudson and the East Rivers as breathing spaces during the summer for the children living in the hot crowded tenement districts of the big city. These piers are open from May to September and there is a concert on each pier every evening from eight to ten.

Public Baths and Swimming Pools

For the hot dog-days the city, moreover, provides an elaborate system of free baths and swimming pools for its boys and girls, where they can swim and splash about in the cooling water to their hearts' content. Teachers are provided to give the children lessons in swimming and diving and other water sports, and the children in their play learn the real value of cleanliness.

The Library's Part in Making Americans

Thus New York City builds up and trains sound bodies for its boys and girls, and what does it do for their minds? We have spoken of the training of the public schools with their classes in domestic science and the trades. The public library takes up the task of training where the public schools leave off. All of the New York libraries have children's reading rooms and tables and wee chairs for the little ones. Many of them have a weekly story hour when a trained story teller tells well-beloved tales to the children. These story hours are usually separated into two divisions — fairy stories for the wee tots and hero tales for the older boys and girls. Often only some exciting bits of a story are related and the story teller stops short with these words: "And the rest of the story can be found in the books on the library shelves." And so a taste for the best reading is cultivated in the children.

Patriotic stories are in particular demand, and the "Washington books" and the "Lincoln books" are positively worn to shreds in the libraries of the lower East Side, by the little foreigners who are eager to learn of the brave men of their new adopted country.

But eager though the child may be to receive reading matter, there is a hard and fast rule that no books may be taken out by little people unless their hands be clean.

"Three minutes after school is dismissed in the afternoon the line begins before the library desk. Ten minutes, and it reaches across the room. Fifteen minutes and it is down the stairway to the door and into the streets. The longest line on record is accorded the Seward Park library branch, where fifteen hundred children with eager faces have been counted draping the stairway and winding around the building and three blocks about the square, all patiently waiting 'to give themselves in to take libraries.'"

When the hands are pronounced satisfactory the children pass into the reading room. Boys and girls just "joining" the library are asked to sign a pledge which reads as follows: "When I write my name in this book, I promise to take good care of the books I use and to obey the rules."

Upon being asked what that means one little girl showed she had a thorough understanding of the matter.

"It means to wash your hands always before you read a book, and not to let my baby tear it."

And so the lesson of cleanliness and the delights of fairy land go hand in hand. It is said that in New York City more than one third of its seven million library books circulate among the children.

AMERICAN HEROES OF SCIENCE

When Cuba came under American rule, she was cursed with a greater enemy to mankind than any foe our country ever faced on the battlefield. Yellow fever, that most dreaded of tropic diseases, had slain its thousands and ten thousands. Its history is one of destruction and death in the West Indies, on and along our southern coasts and in many ports where ships hail from the tropics. Havana, the great shipping centre for Cuba, seems to have fared worse than any other place. For centuries it has been a helpless victim in the face of one outbreak of the fever after another.

THE MYSTERY OF YELLOW FEVER

No one knew how the disease came or in what way it was carried from one person to another. Many thought that in some mysterious way it was carried in the air; others believed it was spread by touching clothing, bedding or any article that had been on or about a yellow fever patient; again, there was a very general belief that the disease came entirely from filth and uncleanliness. So, when Cuba came under our protection and Havana's troubles became our troubles, our first thought was to help in any way we could to save the city from its old enemy, yellow fever. It was planned, first of all, to clean the city up. This was done and there were hopes that the fever would not appear again. But in spite of the care, the disease broke out again and raged worse in the very parts of the city thought to be the most sanitary.

THE MOSQUITO THEORY

It was clear that the cause of the fever and the source of the infection were still a mystery. Something else must be tried. It was at about this time that Dr. Carlos Finley's "mosquito theory" began to attract attention. As a Havana physician, he had said, more than twenty years before, that he believed this fever was carried from one person to another by a certain kind of mosquito. No one believed him at first. But he kept on talking about it and writing about it and made some experiments himself. In the end the people became interested in the mosquito theory and were willing to make great sacrifices to find out what truth there was in it. The story of this search is the story of the heroic work done by the United States Yellow Fever Commission in Cuba during the summer and fall of 1900.

THE MEN WHO TRIED TO FIND THE TRUTH

The commission was made up of four physicians, all well known in the world of medicine. Major Walter Reed, surgeon in the United States army, was in charge, and with him were contract surgeons, Dr. James Carroll, Dr. Jesse W. Lazear and Dr. Aristides Agramonte.

Quemado, Cuba, was chosen as the field for their experiments. Here they arrived on June the twenty-fifth, and work in the yellow fever hospitals and laboratories began at once. Never did four men go out more certainly and battle with death. Their self-sacrifice and courage equal the bravery of any soldier on the battlefield.

As no animal ever takes the disease, all the experiments had to be made upon human beings who had never had the fever. They had to submit themselves to the bites of mosquitoes known to have bitten yellow fever patients. The mosquito Dr. Finley suspected as the cause of all the trouble is known as the stegomyia fasciata. Experiments were begun at once with this kind of mosquito. Dr. Carroll allowed himself to be bitten by one he knew to be infected. In a few days he developed yellow fever, but fortunately got well.

Dr. Lazear was bitten twice. There were no results from the first biting. The second, however, proved fatal. Five days after the infected mosquito bit him, it was known that he had taken the disease, and, after a week's illness, he died. His death was felt to be a great loss indeed. He was a young man of great ability and well trained to do just the work he had in hand.

Work was begun again in November. It was decided to have an experimental station one mile away from Quemado and carry the work on there. In honour of their co-worker they named it Camp Lazear. Two houses were built on the chosen site, one was called the infected-mosquito house and the other the infected-clothing house. In these two houses experiments were to be carried on. The infected-mosquito house was divided into two rooms separated from each other by a wire screen. Everything about the house was carefully disinfected. In one room were to be placed mosquitoes that were known to have fed on the blood of yellow fever patients. The other room was to be kept free from the insect. The wire screen prevented any mosquito going from one room to the other. The plan was to put men who had never had the disease in each room and await results. Volunteers were called for. There was a quick response. John Moran and Jim Kessinger, a young Ohio soldier, offered to go into the room with the infected mosquitoes.

These two soldiers lived in the room with the deadly mosquitoes and allowed themselves to be bitten by them a number of times and in a few days developed the fever. The men who lived in the room where there were no mosquitoes showed no signs, whatever, of the disease.

WHAT THESE EXPERIMENTS PROVED

The infected-clothing house was small. It was built to let in the least amount of air needed for life, in short everything about it was most unsanitary. The plan here was to fill the place with clothing and linen taken from yellow fever patients, then to have people live in this atmosphere for several weeks. Volunteers were again called for, and the offers again came quickly. Dr. Cook with two privates entered the house. They unpacked tightly covered boxes containing soiled pillow-cases, blankets, and clothing from patients in the yellow fever hospital. They handled the clothes thoroughly, shook them out to scatter the germs, if they contained any, and hung the articles around the room. In the midst of this they lived twenty days. Not one of the men showed any signs of the disease when the quarantine was lifted.

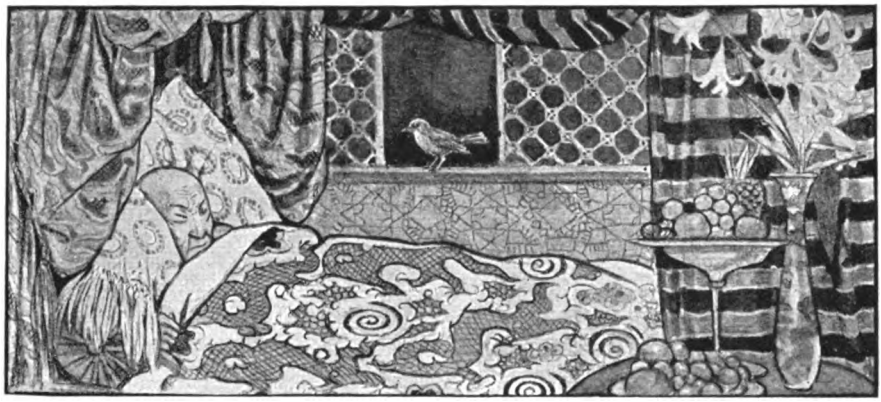
Untiring work in investigating went on for months. Experiments were made under more and more trying conditions. Men wore clothing of yellow fever patients for days, they slept in infected bedclothes, they allowed themselves to be bitten by mosquitoes that had fed for days upon yellow fever patients, they exposed themselves in every possible way to the attacks of this disease.

All this sacrifice, to give one great truth to science. We know now, beyond doubt, that the mosquito, stegomyia fasciata, is the tiny man-slayer. We know too that it is the only agency by which the disease is carried from one person to the other. There is no danger from the dreaded fever so long as one has not been bitten by this kind of mosquito.

As soon as these facts were made known those in charge at Havana set to work to kill off the deadly mosquito. There have been small outbreaks from time to time and the disease has appeared along the southern coast; but it has been stamped out and it isn't likely that these places will ever have another terrible scourge. Each appearance of the disease will cause less and less general fear or danger. Dr. Carroll, as you know, took the fever and barely escaped with his life. Dr. Lazear and some of the volunteers died. Dr. Reed braved the perils of his companions and was the inspiring genius of the investigation. Though he escaped with his own life, his health was so broken that he did not recover from a fever contracted during the following year — but his campaign against yellow fever was a victory. His name should be a household word.

THE LITTLE GREY BIRD IN THE BRANCHES

They went together to the wood where the nightingale used to sing, and half the Court went with them. On and on they went till they reached the wood, and the little girl stopped before a tree. "There she is!" said she. "Listen, listen! There she sits!" And she pointed to a little grey bird up in the branches.



THE EMPEROR'S NIGHTINGALE

CONTINUED FROM 3124

THE palace of the Emperor of China was the most magnificent in the world. It was made entirely of fine porcelain, exceeding costly, but at the same time so brittle that it was dangerous even to touch it. The emperor's garden extended so far that even the gardener did not know the end of it.

Whoever walked beyond it, however, came to a beautiful wood with very high trees, and beyond that to a lake. The wood went down quite to the lake, which was very deep and blue; and among the branches dwelt a nightingale, who sang so sweetly that even the poor fisherman, who had so much else to do when he came out at night-time to cast his nets, would stand still and listen to her song.

Travellers came from all parts of the world to the emperor's city; and they admired the city, the palace, and the garden; but if they heard the nightingale, they said: "This is best of all." And they talked about her after they went home, and learned men wrote most beautiful verses about the nightingale of the wood near the lake.

These books went round the world, and one of them at last reached the emperor.

"What in the world is this?" said he. "The nightingale! I do not know it! Can there be such a bird in my garden without my having heard of it?"

So he called his gentleman usher. Now this was so grand a personage that no one of inferior rank might speak to him; and if one did venture to ask him a question, his only answer was "Pish!"

"There is said to be a very remarkable bird here, called the nightingale," said the emperor. "Her song, they say, is worth more than anything else in all my dominions. Why has no one ever told me of her?"

"I have never before heard her mentioned," said the gentleman usher. "She has never been presented at court."

"I wish her to come and sing before me this evening," said the emperor. "The whole world knows what I have, and I do not know it myself!"

"I have never before heard her mentioned," said the gentleman usher, "but I will seek her."

But where was she to be found? The gentleman usher ran up one flight of steps, down another, through halls, and through passages; not one of all whom he met had ever heard of the nightingale, and the gentleman usher returned to the emperor and said:

"It must certainly be an invention of the man who wrote the book."

"But the book in which I have read it," returned the emperor, "was sent me by the high and mighty Emperor of Japan, and therefore it cannot be untrue. I wish to hear the nightingale; she must be here this

evening, and if she does not come, the whole Court shall be flogged."

"Tsing-pe!" exclaimed the gentleman usher; and again he ran upstairs, and downstairs, through halls and through passages, and half the Court ran with him; for not one would have relished the flogging.

At last they met a poor little girl in the kitchen, who said:

"Oh, yes, I know her very well!"

"Little kitchen maiden," said the gentleman usher, "I will procure for you a sure appointment in the kitchen if you will conduct us to the nightingale."

So they went together to the wood where the nightingale used to sing, and half the Court went with them.

On and on they went till they reached the wood, and the little girl stopped before a tree.

"There she is!" said she. "Listen, listen! There she sits!" And she pointed to a little grey bird up in the branches.

"How simple she looks!" said the gentleman usher.

"Little nightingale!" called out the kitchen-maid, "our gracious emperor wishes you to sing something to him."

"With the greatest pleasure," replied the nightingale; and she sang in such a manner that it was delightful to hear her.

"Most excellent nightingale!" said the gentleman usher, "I have the honour to invite you to a court festival which is to take place this evening, when his Imperial Majesty will doubtless be enchanted with your delightful song."

"My song would sound far better among the green trees," said the nightingale. However, she followed willingly when she heard that the emperor wished it.

There was a general cleaning and polishing at the palace; the walls and the floors, which were all of porcelain, glittered with a thousand gold lamps; the loveliest flowers, with the merriest tinkling bells, were placed in the passages; there was a running to and fro, which made all the bells to ring, so that one could not hear one's own words.

In the midst of the grand hall where the emperor sat, a golden perch was erected, on which the nightingale was to sit. The whole Court was present, and the little kitchen-maid received permission to stand behind the door, for she had now actually the rank and title of "Maid of the Kitchen." All were dressed out in their finest clothes; and all eyes were fixed upon the little grey bird, to whom the emperor nodded, as a signal for her to begin.

The nightingale sang so sweetly that she touched the hearts of all who heard her, and the emperor was so delighted that he said: "The nightingale shall have my golden slippers and wear them round her neck." But the nightingale said:

"I have seen tears in the emperor's eyes. That is the greatest reward I can have."

Yes, indeed, the nightingale's success was complete. She was now to remain at court, and to have her own cage, and all the city was talking of the wonderful bird.

One day a large parcel arrived for the emperor on which was written "Nightingale."

"Here we have another book about our far-famed bird," said the emperor.

But it was not a book; it was a little piece of mechanism, lying in a box—an artificial nightingale, which was intended to look like the living one, but was covered with diamonds, rubies, and sapphires. When this artificial bird had been wound up, it could sing one of the tunes that the real nightingale sang; and its tail, all glittering with silver and gold, went up and down all the time. A little band was fastened round its neck, on which was written: "The nightingale of the Emperor of China is poor compared with the nightingale of the Emperor of Japan."

"That is famous!" said everyone; and he who had brought the bird obtained the title of "Chief Imperial Nightingale Bringer." "Now they shall sing together; we will have a duet."

And so they must sing together; but it did not succeed, for the real nightingale sang in her own way, and the artificial bird produced its tones by wheels.

"It is not his fault," said the artist; "he keeps exact time, and sings quite according to method."

So the artificial bird must now sing alone; he was quite as successful as the real nightingale. And then he was so much prettier to look at; his plumage sparkled with jewels, silver, and gold.

Three-and-thirty times he sang one and the same tune, and yet he was not weary; everyone would willingly have heard him again. However, the emperor now wished the real nightingale to sing something. But where was she? No one had remarked that she had flown out of the open window, flown away to her own green wood.

"What is the meaning of this?" said the emperor; and all the courtiers abused the nightingale, and called her a most ungrateful creature. "We have the best bird, at all events," said they. And for the four-and-thirtieth time they heard the same tune; but still they did not quite know it, because it was so difficult.

The real nightingale was banished from the empire; but the artificial bird had its place on a silken cushion, close to the emperor's bed. All the presents he received, gold and precious stones, lay around him; he had obtained the rank and title of "High Imperial Dessert Singer."

Thus it went on for a whole year. The emperor, the Court, and all the Chinese knew every note of the artificial bird's song by heart; but that was the very reason why they enjoyed it so much—they could now sing with him.

But one evening, when the bird was in full voice, and the emperor lay in bed and listened, there was suddenly a noise, "bang!" inside the bird; then something sprang, "sur-r-r-r!" all the wheels were running about, and the music stopped.

The emperor jumped quickly out of bed, and had his chief physician called. But of what use could he be? Then a clockmaker was fetched, and at last, after a great deal of consultation, the bird was in some measure put to rights again; but the clockmaker said he must be spared much singing, for the pegs were almost worn out, and it was impossible to renew them. There was great lamentation, for now the artificial bird was allowed to sing only once a year.

When five years were passed away, a great affliction visited the whole empire. The emperor was ill, and it was reported that he could not live.

Cold and pale lay the emperor in his magnificent bed. The floors of all the passages were covered with cloth, in order that not a step should be heard; it was everywhere so still—so very still. But the emperor was not yet dead. Stiff and pale he lay in his splendid bed, with the long velvet curtains and heavy gold tassels. Death sat at the emperor's bedside, and the emperor was afraid. A window was opened above, and the moon shone down on the emperor and the artificial bird.

"Music, music!" cried the emperor. "Thou dear little artificial bird, sing, I pray thee, sing! I have given thee gold and precious stones; I have even hung my golden slippers round thy neck! Sing, I pray thee, sing!"

But the bird was silent; there was no one there to wind him up, and so he could not sing. Death continued to stare at the emperor with his great hollow eyes; and everywhere it was still—fearfully still.

All at once the sweetest song was heard, and the room became filled with such beautiful sounds that Death could not stay. The music of the real living nightingale could vanquish Death, who, like a cold white shadow, flew out at the window.

"Thanks, thanks!" said the emperor. "Thou heavenly little bird, I know thee well. I have banished thee from my realm, and thou in return hast brought me back to life. How shall I reward thee?"

"Thou hast already rewarded me," said the nightingale. "I have seen tears in thine eyes, as when I sang to thee for the first time. Those I shall never forget; they are jewels which do so much good to a minstrel's heart. But sleep now, and wake fresh and healthy. I will sing thee to sleep."

And she sang, and the emperor fell into a sweet sleep. Oh, how soft and kindly was that sleep!

When all the people knew that their emperor was whole again, their joy knew no bounds, and the little nightingale was the most popular person in the land.

The emperor begged her to stay with him and live in the palace, but to this she would not consent.

"I must be free," said she. "But in the evening, when you are alone, I will come and sit on the branch of a tree by your window and sing to you of the good and evil of the world, and fill your mind with beautiful, helpful thoughts."

THE BLUE BIRD

PRINCESS FLORINA was so beautiful that, when King Charming saw her portrait, he fell in love with her, and came with his minister to ask her hand in marriage. Unhappily, Princess Florina had a wicked stepmother and an ugly stepsister, who was called Troutina because her face was as spotted as a trout's skin. When King Charming arrived, the stepmother took him to Troutina, whom she had arrayed in the richest robes and the loveliest gems which she possessed.

"But where is Princess Florina?" said the king, frowning. He saw her sitting in a corner, dressed in calico, and hastened to her and said, with a tender smile:

"Princess, you do well to dress plainly. Beauty such as yours needs no adornment."

"Don't waste compliments on Florina," said the stepmother. "She is a very vain girl. Look! Dear Troutina is waiting for you."

The king, however, stayed beside Florina, and talked with her for three hours, and talked so sweetly that he won her heart.

But when he came next morning he could not find her. The stepmother had shut her in a high tower. King Charming then resolved on desperate measures. He bribed a maid to show him the window of the chamber in the tower where the princess was imprisoned, and he came there at night with a carriage and a long ladder, and climbed up to the window. A veiled girl appeared, and he lifted her down and put her in the carriage and drove off with her.

"Take me to the lodge in the forest," she said. "My godmother lives there, and she will help me."

They reached the lodge, and a dwarf opened the door, and showed the king and the veiled girl into separate rooms. The wall between the rooms, however, was very thin, and the king heard two voices speaking, and listened.

"How did you manage it?" said the first voice.

"Oh," said the second voice, "a maid told me that the king had bribed er to show him where Florina was imprisoned! So I removed the princess into the garret, and went into her chamber and veiled myself, and King Charming came and carried me off in her stead. Having eloped with me, he cannot now refuse to marry me."

"But I do refuse!" cried the king, striding into the next room, where he found Troutina talking with a witch.

"Wait!" said the witch. "You have not yet been asked to marry my god-daughter. I will teach you first to esteem her, and when she deigns at last to offer you her hand, you will not refuse it."

Striking the king thrice with her wand, the witch danced around him, and sang:

He who flirts and flies away
Shall have wings to carry him!
Shrike and hawk and shrieking jay
Hunt him down and harry him!
Till the maid he slights to-day
Condescends to marry him.

King Charming at once changed into a blue bird, and flew out of the witch's lodge into the forest.

The next morning, when Princess Florina opened her window, a blue bird flew down with an emerald ring in its beak, and put the ring on the window-sill, and then perched there and sang to her so sweetly that she said:

"Charming! Charming!"

"Ah, you still know me!" said the blue bird. "Yes, dearest, I am King Charming. I have been changed into a bird because I would not marry vile Troutina."

"And I have been imprisoned because you are in love with me," said the princess. "But never mind. We can now see each other more often than we could before."

'Put this ring on your finger," said the blue bird. "I flew into my rooms early this morning to get it for you. It is an engagement-ring."

The princess kissed the blue bird very tenderly, and put on the ring.

"Now," said the blue bird, "I will return and fetch a bracelet I had made for you."

But Troutina had seen the blue bird enter Princess Florina's chamber, and she had got a fierce hawk, which she flew at the blue bird as it came out of the window. Happily, King Charming's minister, who had been searching every-

where for his master, chanced to be passing, and he picked up the poor blue bird as it fell wounded to the ground.

Being a wizard as well as a minister, he was not at all astonished when the blue bird spoke to him and said that it was the king. On learning all that had happened, he took the blue bird to the witch, and said that King Charming would marry Troutina in a week's time, if he were at once healed and restored

When she reached the palace the people had assembled to see the wedding procession, and, owing to a strange commotion inside, she was able to enter unperceived. On reaching the great hall, she saw two pigs rushing about, with the witch, very much excited, running after them.

"It's no use," the king's minister was saying to the witch. "There is another wizard here besides me. Trou-

THE WITCH WAS RUNNING AFTER TROUTINA AND HER MOTHER, WHO HAD TURNED INTO PIGS

to his own shape; and with three strokes of her wand the witch undid her spell.

"Keep the witch quiet by preparing for the wedding," said the minister to the king, "and I will find another wizard, and the two of us will outwit her."

Troutina and her mother set out for King Charming's palace, where the marriage was to take place, and Princess Florina escaped from the tower and followed them, saying sadly to herself:

"I must see him and return the ring."

tina and her mother have been turned into pigs, and pigs they shall remain."

"On with the wedding procession!" cried King Charming, catching sight of Princess Florina. "The real bride has come." And, kissing Florina, he led her to the royal carriage, and as they drove to the cathedral all the people shouted "Hurrah!" and danced and sang with glee, because the king was going to marry the beautiful princess whom he loved so much.

SOME ENGLISH LEGENDS

ST. VINCENT'S ROCKS

VINCENT and Goram were giants, so tall that they could look over the tops of trees, so strong that they could use a pickaxe with a handle sixty feet long. They lived by the River Avon, near Bristol, and it was Vincent and Goram who cut a way for the river through the rocks. But they had only one pickaxe, and agreed, therefore, to work in turns. Vincent worked for an hour, and then threw the pickaxe to Goram, who began digging at a spot three miles away. Then Goram in his turn threw the axe back to Vincent.

One day, as Goram rested in the big armchair he had cut out of the rocks, he fell asleep, and did not hear his brother shout that the axe was coming, so that the axe hit him on the head with great force and killed him.

Vincent was heart-broken, and burying his brother's body in the sea, he piled up rocks and clay from the glen—now called Coombe Dingle—and made a mound so big that the waters could not reach over it. Beneath Dunball Island, it is said, Goram still lies, and the rocks through which Vincent cut the way alone are called St. Vincent's Rocks even to this day.

BYARD'S FAMOUS LEAP

NEAR Newmarket, in Lincolnshire, there are three marks of a horse's hoofs, and each mark is seven yards distant from the other. Every man who farms the field is careful to keep these marks from being grass-grown or ploughed up. For they are the famous marks of Byard's leap, which is recounted in the following story:

There was once a witch of Newmarket who bewitched the cattle and crops of her neighbours, and did all sorts of mischief, and at last one farmer went to a wise man and asked him what to do to overcome the witch.

"Tie a naked dagger round your waist," said the wise man. "Then drive your horses into a pond at night and throw a stone into the pond. Mount the horse that lifts his head up first, and gallop off to the witch's hut, and bid her out to ride with you." Byard, a blind horse, was the first to raise his head when the farmer threw the stone, so the farmer mounted him and galloped to the witch's hut and cried:

"Out and ride with me! Out and ride with me!"

And out came the witch. She jumped at the horse, and Byard made his first leap, and got away. She jumped again, and Byard made his second leap and got away. At the third leap she sprang behind the farmer and wound her skinny arms about his waist. But the dagger cut her left arm, and she lost all her power, and was never able to trouble anybody again.

THE FAIRY TULIPS

SOME time ago an old woman came to live by a fairy field on Whitchurch Down, in Devon, and she planted about her cottage a garden of tulips. The fairies got very fond of these gay flowers, and under their care the tulips became more fragrant than any rose or violet, and they blossomed all the year long.

The fairies used to carry their babies at night into the garden, and put them in the tulips, and rock and sing them off to sleep; and they sang so sweetly that the old woman often sat up late to listen to their singing.

But at last the old woman died, and the new tenant uprooted all the tulips and sowed cabbages in the garden. This made the fairies very angry, and they bewitched the garden, so that nothing could ever grow there again. Then they planted the tulips on the grave of the old woman, and there, it is said, the fairy flowers still bloom.

THE STORE THAT NEVER GREW LESS

ONE wild winter night, a little woman in a green cloak knocked at a farm on the east coast of Buchan, and asked for the loan of some oatmeal. The farmer's wife had only meal enough for three days, but she gave the little woman half of it. The next night the littie woman brought back the meal and said:

"Mix this with the rest, and you will not want any more."

In the night there was a very great snow-storm, and the roads were quite blocked up for thirteen weeks. All that time everybody in the farm had to live on the fairy meal, and no matter how much they ate, their scanty store never grew less, thanks to the good fairy.

THE SAD HEART OF LITTLE TROTT

This pathetic little story is told by the French writer, André Lichtenberger.

A GREAT sorrow has overwhelmed the heart of Trott.

No one loves him any more at all. Well, perhaps, just a very little still; but it is not as it used to be. And when one has been petted and loved tremendously, that is not enough. Trott has a heart like lead; it is just as if he had eaten too much apple-tart. And to-day things have gone worse than ever.

This morning Trott was taking his lesson with his governess, and he was grumpy. Although, as a rule, he is very polite, he said a word to her which was not quite proper. And papa, who was coming in at that moment, heard it. Trott was not allowed to have any dessert. Alas! there was whipped cream that day.

After luncheon Trott hurried away from the room to stretch his legs. He rushed angrily out of the dining-room, and slammed the door. His baby sister woke up and uttered a dismal howl. Mamma said: "Trott is insufferable!"

TROTT GETS UP AND STANDS ON HIS CHAIR

That evening, when he returned from his walk, it was almost dark. At such a time one has a rather melancholy feeling, and it is nice to be petted. Trott thought he would go and find his mother, and sit in his usual place in his own little chair beside her couch. He found the place occupied by little Lucy in her cradle.

Mamma was so busy crooning and making pretty faces to the baby that she gave Trott scarcely more than one hasty little kiss. Trott felt very cold, and bruised about the heart. He went to the window and sat there quite alone, watching the night's slow descent over the garden.

And now papa comes in. He takes a seat close to baby-girl, and says over his shoulder to Trott:

"Hallo, my boy! Are you still sulking?" And then he begins chatting with mamma about baby, who is clutching his finger.

Trott hides himself in his corner. His wretchedness grows still deeper. It is certain now, absolutely certain, that no one loves him any longer. Hitherto, when he was naughty, they scolded him a little, and then it was over; they embraced him more than ever afterwards, so that he felt it was very good to have been scolded. But to-day they have scolded him severely, and have not caressed him at all afterwards. What shall he do? Oh, to think how they had once loved him—a great deal, ever so much! And when he had been ill—ah, they had loved him tremendously then! Suppose he were to fall ill now! Perhaps . . .

It is an idea. Baby has been carried away. Nobody is looking. Father and mother are talking in a low tone. With a quick movement Trott gets up and stands on his chair. He leans both hands on the back and gives a strong push. The chair falls over with a frightful crash, and Trott rolls on the floor into the middle of the room.

Mamma utters a loud scream. Papa rushes towards Trott and hurriedly examines his forehead. But mamma wishes to have him to herself; she snatches him up, takes him upon her lap, hugs him, caresses him, calls him all manner of dear and tender names. Trott cries with joy and with pain,

for he has a big bump on his forehead.

"How did you manage to fall over, poor little man?"

Trott cannot reply. He is sobbing too fast. At last he manages to blurt out, between two big sobs:

"I—did it—on purpose!" Father and mother look at each other in bewilderment. What can the boy mean? What is to be said to that?

One must never tell a lie. Although it is difficult, with so many tears running away from his eyes, Trott tells the whole truth. He did it on purpose because he wanted to know if mamma and papa really did love him any longer. He knew, of course, that they could not love him, being old, as they loved his sister, who was new. But he thought that perhaps they could still love him a little bit. He wanted to find out. And now he is quite happy, he is very glad, although . . . The torrent of tears increased in violence.

Mamma passes a loving arm around Trott's neck and gently mops his scalding eyes. Papa holds the little hands in his. They both smile, but it is a very tender smile. The music of their sweet and gentle words begins to soothe Trott's heart. He is told something, too, which appears very grand and wonderful in his ears. It is quite plain that he is loved just as much as ever, quite as much even as little Lucy. They love her because she is so weak and helpless. He is a fine, big, strong boy, and he must watch over baby sister, guard her and help her, because she has no strength. It is Trott's duty to look after this baby. And they love him quite the same, most certainly, every bit as much.

Papa lifts up his little son in his arms, presses a big kiss on each cheek, and asks, as he looks him in the face:

"Now, are you comforted at last, my little man?"

And Trott replies, his eyes still red, but with his lips full of smiles:

"Yes; but, all the same, I am very glad I made such a big bump."

THE WOODEN DAUGHTER OF DESCARTES

The great French philosopher, René Descartes, who was a diminutive man with a very big head, wanted to prove that animals have no souls. He held that all their movements could be explained without supposing that they possessed souls. In order to show how easily the power of movement could be given to a creature, he constructed a wooden doll, "a female automaton," which, by the very slightest touch, could be made to perform certain motions. This clever and ingenious doll became a jest, and people said that it was a real girl, the daughter of Descartes, and that her name was Francine.

And this was the end of Francine. The philosopher had occasion to send her a journey by sea, and the wooden daughter was packed in a box and put on board a Dutch ship. Now Francine moved so easily that the motion of the ship kept her tapping and rapping in her box all day long. The captain of the ship had the curiosity to discover what caused this tapping, and on lifting the lid of the box he was first amazed, and afterwards terrified, to behold a little female who jumped and bumped about, like an imp from the underworld. He touched her, and she felt like wood. Convinced now—for he was a superstitious man—that the occupant of the box was really a little fiend, he hastily seized up Francine and flung her, with violent quickness, far out to sea. And thus perished the wooden daughter of the great philosopher.

Of wooden figures that move, Roman Catholic priests long ago gave us excellent examples. The famous Bishop Fisher exposed at St. Paul's, and afterwards broke to pieces for a cheat, a figure of a saint which was able to bow down and lift itself up, to shake and stir the hands and feet, to move the head and roll the eyes, "to wag the chops," to bite the lip, and which had the power of "gathering a frowning, froward and disdainful face when it would pretend offence, and showing a most mild, amiable, and smiling cheer and countenance when it would seem to be well pleased." Credulous people, deceived by the priests, used to worship these wooden images, and believed that it was their prayers which caused the movements.

Descartes tried to disprove a soul for animals by the very same means with which priests tried to prove a soul for fools. Francine was thrown into the sea, and the images into the bonfire.

SIR TRISTRAM OF LYONNESSE

A STORY OF KING ARTHUR'S TABLE ROUND

TRISTRAM was a king's son, and dwelt at Lyonnesse. He was famous at his father's court for his beauty, his courage, and his skill at music. But his stepmother hated him out of her jealousy, and the king sent Tristram to the court of the young man's uncle, King Mark of Cornwall, so that his stepmother should do him no injury.

Now, in Cornwall, Tristram found King Mark and all his knights in a state of fear. They had refused to pay tribute to King Anguish of Ireland, and the terrible knight, Sir Marhaus, had arrived with ships, and now lay off the coast challenging the bravest of Mark's knights to meet him in battle. None durst fight the great Irishman, and Mark bit his lips with rage. Then the beautiful Tristram of Lyonnesse said: "Make me a knight, and I will meet this Sir Marhaus."

So Mark made him a knight, and the strong youth, henceforth to be famous and eternal throughout Christendom as Sir Tristram of Lyonnesse, went out to encounter Sir Marhaus. They met on an island, and when Sir Marhaus saw how young was this knight, he courteously bade him think twice before meeting death so early.

But Tristram answered boldly, and their horses clashed together. Long was the fight. Both men were dashed from the saddle, and fought fiercely on foot. The lance of Sir Marhaus pierced the side of Tristram, and the blood flowed in a river; but bravely did the boy fight on, and at last, raising his sword, he brought it down on the head of Sir Marhaus so that it crashed through the skull.

Thus Tristram won his first fight. But his wound was sore, and it was said that to heal it he must needs go to the land of him who had dealt the blow; so Tristram passed to Ireland. Now, as he lay off the coast of that country, he sat upon deck playing the harp, and the music reached one who ran to King Anguish with the news of it, and King Anguish sent for Tristram. Tristram, who had slain Sir Marhaus, brother of the Irish queen, called himself Sir Tramtrist, and was welcomed by the king, the queen, and their daughter, the fair Isolt. To Isolt Tristram taught music, and she tended his wound, and they were like brother and sister together.

THE GOOD SIR TRISTRAM DISCOVERS HIMSELF TO KING ANGUISH

Now, at the court was a Saracen of enormous strength, by name Sir Palamides, who, although a heathen, did yet overthrow the knights of Christendom, and was proud and haughty and disdainful in his bearing.

This man teased Isolt with protestations of love, and would not take the maid's "Nay," but must always declare that before long she would love him.

So, one day, being at a tournament, for Isolt's sake, Tristram met this boaster; and Tristram, who wore white armour and rode upon a white horse, crashed against Sir Palamides in black armour and mounted on a black horse, and with his lance drove the Saracen over his horse's tail, and only spared his life on condition that never again would he pester the fair Isolt.

Then Tristram returned to Cornwall; but his uncle, who sought a wife, sent him to Ireland to bring back the fair Isolt, that she might be Queen of Cornwall. Now, on the way back to Cornwall with Isolt, as he lay at her feet on the ship's deck harping, Tristram grew thirsty, and seeing near him a flask, he gave it first to Isolt to drink, and then himself drank. Now, this was a love potion made by Isolt's mother for Mark and Isolt only; for those who drank of this magic wine loved each other for ever after. And so it came to pass that when Tristram looked next upon Isolt, and Isolt looked upon Tristram, they loved each other with a great love, and were afraid.

Sir Tristram gave Isolt to King Mark, and then rode away and became Knight of the Round Table. And it came to pass that one day as Isolt walked in the forest, the Saracen suddenly appeared, and by guile carried her off. But as they rode through the forest a knight challenged Sir Palamides, and while these two fought, Isolt crept away, and was presently found by one who carried her to his castle in all honour. Then came the furious Sir Palamides to the castle, and sat down before it like one mad.

But Tristram, who had heard of Isolt's danger, rode up before the castle, very terrible and calm, and gave battle to Sir Palamides. The din of their fighting reached Isolt, and she looked from the window; and when she saw the Saracen stretched upon the green grass, and Sir Tristram standing over him with lifted sword, she cried to him to spare. And at the sound of her voice Tristram grew pale and shook exceedingly, for he loved her dearly. Then, on condition that Sir Palamides became a Christian and joined the brotherhood of King Arthur, he spared him, and Sir Palamides lived to be a very gentle and honourable Knight of the Round Table.

THE BRAVE SIR TRISTRAM OF LYONNESSE, WHO DEFEATED THE SARACEN KNIGHT

This photograph and that on page 3211 are by Messrs. Ellis and Walery.

Then Sir Tristram carried Isolt to King Mark, and tarried long at the Court of Cornwall. But King Mark hated Tristram; and one day, as Sir Tristram harped to Isolt, the villainous Mark sprang from a hiding-place and clove Sir Tristram through the skull; and the death of Tristram broke the heart of the fair Isolt, and she faded away.

THE NEXT STORIES ARE ON PAGE 3305

WHAT THIS STORY TELLS US

THERE is no food question that people differ so strongly about as the eating of meat. And we know that different animals have very different opinions on this subject, too. Some people even think it is wrong to kill animals for their flesh, but most people think it not wrong so long as the animals are killed mercifully. Nearly all well-to-do people eat too much meat; everyone who knows is agreed about that. As for children, they need even less meat than grown-up people do, and often suffer even more severely than grown-up people from taking too much meat. Fish is a cheap and good kind of meat, and eggs are, of course, animal food, just as milk is, though people call themselves vegetarians who could not get on for a day without milk and its products. Eggs, as we learn here, are very good for children, as they are for everybody. It is a pity that, like animal foods in general, they are not cheap.

THE VALUE OF MEAT AS FOOD

CONTINUED FROM 3113

THE kind of food that we must now study is a very important one, whatever the real truth about it may be. Very nearly all of us like meat. It has such a great deal of taste, and even when we are taking other things, we like a little meat flavour in them. Now, there are several arguments of one kind and another why we should not eat meat, and there are several which suggest that we should eat meat. One thing is quite certain, at any rate, and that is that we are wrong if we make up our minds before we have looked at the facts. There is a special word, *prejudice*, which literally means "judging before," that is, to decide before we have a right to judge; and in this question of eating meat most people are prejudiced. We must try to be fair, and to follow the truth wherever it leads.

Now, in the first place, let us consider the most important of all the arguments, and that is whether it is right to take life for the purposes of food. Some religions have taught that it is wrong. There are parts of the world where a man will move the tiniest worm or insect out of the path, lest someone should tread on it, and where it is regarded as wrong to take life of any kind, even the life of a poisonous serpent or biting insect. Perhaps the truer idea is that it is wrong to take life for pleasure, but that it may be quite right to take lower forms of life in order to serve higher forms of life; perhaps it is wrong to kill a serpent just for fun, but it is certainly right to kill a serpent to save a child. Now, when we eat meat, of course it means that an animal has been killed. This is true also when we eat an egg, for the egg is a very young animal. But no one really objects to the eating of eggs, because we know that when we kill the egg, which we do when we cook it, we inflict no cruelty. That, surely, is the real question. In the case of the sheep or the ox, then, we have to remember, first, that in any case the animal must die some time, for all living creatures are mortal. If we kill it without pain and instantly, that is far more merciful than if the animal were allowed to die of disease or old age, and a thousand times more merciful than Death is in his dealings with mankind; and we may say that while the animal was alive it enjoyed its life, and that though we brought the animal into existence for our own purposes, yet it owes to us the happiness it had during its life.

This means that the highest question regarding the eating of meat is the question as to how the animals are killed. Whenever there is reason to suppose that animals are killed less quickly than need be and with some cruelty—either by carelessness or to save expense, or because the meat

looks nicer, or for any other reason—then we should protest, and say that we will not eat meat unless we know that the slaughter-houses are as good as they can be in this respect. But if these conditions are complied with, then surely we may say that so far from our practice of eating meat being a cruel one, it really means conferring the pleasure of life upon a great many creatures which would otherwise not have come into existence at all, and that the only price which they have to pay is the price which all creatures must pay for life, and that the smallest possible—a painless, unfeared death.

So now, if we always remember this question about the killing of the animals, I think we may regard the moral question as satisfactorily settled, and may go on to study the good and bad results of meat-eating simply as a question in the science of the body. There are, first of all, some very interesting arguments derived from the study of life, which we ought to know.

SOME CLEVER ANIMALS THAT EAT FLESH, AND OTHERS THAT EAT GRASS

When we study the higher animals, it is not possible to prove from their diet that it is better either to eat meat or not to eat it. It is true that the carnivorous, that is, the flesh-eating, animals are very intelligent, quick and graceful in their movements. We can see this with both the big cats and the little cats at the zoos, and it is, of course, interesting to compare their quickness with the slower movements of herbivorous, or grass-eating, animals, like oxen and sheep.

We know, too, that one of the most intelligent of animals is the dog, which is really a tame kind of wolf, and is carnivorous. But there are animals more intelligent than the dog: these are the monkeys and the apes, and none of them eat flesh. The truth, I believe, is that the quickness and intelligence of the flesh-eating animals is not derived from the flesh they eat, but is due to the fact that animals which live by hunting other animals must be quick and intelligent, if they are to live at all.

The intelligence of the higher apes is the highest in the world, with the exception of our own. Yet fruits and nuts, and that kind of thing, make up their food. Their teeth and ours are very closely alike; they are, indeed, the same in number and arrangement, and differ only in small details. They are certainly not the teeth of animals meant to seize and kill other animals. It is true that the gorilla has huge canine, or eye, teeth, but they are for fighting other gorillas with, and not for carnivorous purposes.

THE MAN-LIKE APES THAT LIVE ON FRUIT AND NUTS

So, as far as that goes—as it is very probable that the higher apes and mankind are descended from a common ancestor—we might argue that human beings ought not to eat meat. But that would not be a right argument. In the first place, we find when we study the apes that, though they are not beasts of prey, yet if meat is given to them, they soon learn to like it very much, and thrive exceedingly well upon it; and also a well-known student of the subject has produced evidence which makes us think that, as man has grown in intelligence, his diet has passed from the fruit and nut stage to include meat. So as far as all this goes, though it is very interesting, it is not conclusive in any direction.

Another kind of argument has been based upon comparing different races of men, and also different individuals, with one another. People say that the races that eat the most meat are the leading races of the world, and want us to believe that it is the meat that makes them the leading races of the world. Others say that the races that eat most meat are the brutal, war-like oppressors of the world, and want us to believe that it is the meat that makes them brutal. Now, the question is: Are the facts as they are stated, and would they mean what they are supposed to mean if they were really the facts?

MEN OF MUSCLE AND MEN OF MIND WHO EAT NO MEAT

Almost the most important truth about man, as we have already learnt, is his amazing power of adaptation. The vegetarians in our own country have shown us, during the last twenty or thirty years, that, without the use of meat, it is possible to make athletic records, and to turn out splendid and vigorous works of the mind. They have proved that, and we have to recognise the fact, whether we like it or not.

It used to be said that if we did not eat meat we should become weaklings, soft in body and mind. This is not true, and we have to admit that it is as possible to be strong, both in body and mind, without meat as with it.

SOME PEOPLE WHO SHOULD EAT MEAT AND SOME WHO SHOULD NOT

On the other hand, nobody has yet begun to prove that we should necessarily become stronger, either in body or mind, if we ate no meat. The truth probably is that the great majority of people can adapt themselves equally well to either kind of diet, if they go wisely about it. Also, there is a certain number of people who are so made that it is much better for them to eat meat, while others are better without meat. But, apart from exceptional people, let us see what facts we may be sure of.

It is certain that the *colour* of meat proves nothing as to its use. Nothing makes such good red blood as white milk. The redness neither of meat nor of red wines has any virtue for the making of blood. The only important point about the colour of meat is that white meat, like the breast of a chicken, is more easily digestible than butcher's meat. This is true also of many kinds of fish. All the meat we eat is made of muscle fibres, and muscle fibres vary very much in size and length. The smaller and finer they are, the more easily are they digested; but all white muscles are not easily digested, for the muscle fibres of such a creature as the lobster are very tough and thick, and very difficult to digest.

We learn, then, that the colour of muscle food, in general, proves nothing as to its value. There is some meaning, however, in the *taste* of it. When a food is liked, we know that it is specially liable to call forth the digestive juices, and that is a real recommendation.

THE GREAT FOOD-VALUE OF MEAT SOUP TO SOME PEOPLE

It has also been proved that, even apart from taste, the flavouring substances in meat are more powerful in calling forth the juices of the stomach than any other food. Careful experiments have been made by a great Russian observer, and of all the substances tried, none calls forth the juices of the stomach either in such quantity or in such strength as meat does. From this it follows, in the case of people whose appetite really needs to be helped, that it is sensible to begin a meal with a little clear meat soup. Clear meat soup contains no food matter at all, the food part of meat being tasteless and solid, but it does contain the substances which help the stomach to do its work. Is not the fact that the flavouring matter of meat has this effect upon the stomach a very strong argument in favour of the view that our bodies are naturally adapted to eat meat?

The true food-value of meat depends upon the tasteless, colourless, odourless albumen which makes up the greater part of it, and, secondly, upon the salts it contains. Extracts contain merely the flavour of the meat, omitting all the food except the salts.

THE WILD RUSH OF THE GRASS-EATING ANIMALS TO OBTAIN SALT

It is interesting to know that vegetarian animals, who do not get enough salt in their food, are known sometimes to rush wildly for miles to places where salt can be obtained. These places are sometimes called salt licks. Every creature must have salt, and especially sodium chloride, which is common salt, in its blood. Muscle is rich in sodium chloride, and so animals that live on muscle get enough of it.

It is very important that we should know how far meat is useful for children, and so we must specially discuss that now, as it is really more useful for us in this book than the general question about the use of meat. First, children, like all other living things, differ from one another; one child will like meat, and another will dislike it. Now, in so far as these likings and dislikings are natural to the child, they should very largely be trusted. If the child is in health, and has not had its taste perverted, its body, of which the appetite is the voice, probably knows what is good for it better than other people are likely to guess. *But* we ought to be sure that we are dealing with natural appetite, and not with something that has been made by the special way in which the child has been fed. Many children, indeed, probably most children, if they are regularly and carefully offered highly flavoured dishes, gravies, and

beef extracts and soups, and so on, will very soon get to like meat very much, and will probably be inclined to take much less than they should of foods which, at any rate for them, are simpler, safer, and better. We have Nature's guidance, after all. The food she provides for the child when it is very small has practically no flavour at all. Neither the mouth nor the stomach of a healthy child requires food to be highly flavoured.

THE FOOLISHNESS OF FORCING MEAT UPON YOUNG CHILDREN

Where a child does not care for meat, nothing could be more foolish than to force meat upon it. The appetite of the child that does not care for meat much is far more likely to be the natural unspoilt appetite than not. Meat is a necessary food for no one; it has its risks for all, and least of all is it especially good for children. Probably, the less meat a child has, the better; and nothing is more certain than that if a child be properly fed in other ways, especially with abundance of milk, it suffers no loss of strength or vitality from the omission of meat.

The flavouring substances of meat are of the nature of stimulants, not only to the digestion, but also to the brain. As Baron Liebig said, they make us aware of our strength. Doubtless, this often gives a real value to meat and to preparations of meat in the case of grown-up people, but there is a time to stimulate and a time not to stimulate. Something is always very wrong somewhere when a child needs a stimulant. The natural, healthy child is a perpetual motion machine, except when it is asleep, and its splendid activity puts most of its elders to shame.

WHY LITTLE CHILDREN SHOULD NOT EAT MUCH MEAT

Lucky, indeed, are the grown-up people who have something of the child left in them in this respect, as in many others. Grown-ups may perhaps want stimulants to make them like children, but the problem of the child is rather, if there is any problem at all, to prevent it from getting too excited, and to persuade it to go quietly to bed. In these days, especially, children are apt to become excitable, and then, of course, they have to pay the price for being over-excited. They do not sleep deeply enough, perhaps they have dreams, or even wake up suddenly, terribly frightened. In many cases it will be found that if we have the wisdom to stop giving the child the stimulants which it does not need, and which are only bad for it, we shall cure these troubles. No child should have tea or coffee, as we shall see later, nor any but very small quantities of meat and preparations of meat. We need not fear that the child will suffer. There is no lack of strength or vitality about the gorilla or the elephant or the horse; and these get their strength without eating muscle. The biggest and strongest flesh-eater amongst men is no match for any of these, so far as physical strength is concerned.

It seems now quite certain that well-to-do people, both in this country and in England, eat far more meat than they need, and far more, indeed, than is good for them. As meat is a highly expensive food, this is, of course, a waste from the point of view of money; but the stimulating substances in meat are capable of injuring the body, if they are taken too freely, and that is more serious than injuring the purse.

THE GREAT DIFFICULTY MEN HAVE IN BECOMING TRUE VEGETARIANS

We may fairly say that, during the last fifteen years, all the work that has been done on the subject of food has been in the direction of lessening the importance of meat, reducing the amount of it that is thought desirable to eat, and strengthening the case of the people called vegetarians. It is fair to remember, however, that very unsatisfactory results follow the attempt to live on a really vegetarian diet. So-called vegetarians take milk, which is an animal food, of course, and which, with its various products, butter and cream and cheese, makes all the difference to them.

Of course, the herbivorous animals, after they are very small, take neither milk nor eggs, and are genuine vegetarians. But most vegetable food, such as grass, contains only a very small proportion of real food substance in it, therefore the quantity that has to be eaten is very large, and the business of digesting is very serious. We find, then, that the ox, for instance, has to have a very complicated stomach, which

takes up a great deal of room, and strongly contrasts the shape of its body with the shape of, say, a greyhound's body—for the greyhound lives on concentrated muscle food, and its digestive organs can afford to be quite small. So human vegetarians are apt to have not the most elegant of figures. Also, it can easily be proved that the digestive organs of man are nothing like so capable of dealing with vegetable food as are those of such an animal as the ox. They are not so large or so complicated, nor so strong; and they cannot produce nearly such powerful juices.

ANIMALS THAT HAVE TO KEEP EATING ALL THE TIME THEY ARE AWAKE

Still more interesting is the question of time. The herbivorous animal has practically to spend the whole of its time eating, when it is not asleep. I do not say that this is so if we supply it with specially nutritious kinds of vegetable food. But if we allow for the labour and time required in digesting as well as for the time required for chewing, in the first place, we shall soon see that the vegetarian has to devote far more of his life to eating than the person who takes his food in a more concentrated and more digestible form, and who, therefore, has far more time to devote to the real business of living; for we human beings, at any rate, must eat to live, and not live to eat.

Fish is, of course, really a form of meat. It is a very good food, very cheap—unless we choose to pay for flavour — and the eating of large quantities of it is less liable to injure the body than is the case with butcher's meat. There is no truth in the notion that fish has a special value for the health of the brain. Fish does not contain more phosphorus than other kinds of meat, as used to be supposed.

THE GREAT VALUE OF EGGS AS A FOOD FOR MAN

Eggs are excellent food. We know what the egg becomes, and everything that makes up the body of the living chicken must have been in it except for a certain amount of oxygen, which was breathed in through the eggshell. White of egg very largely consists of water; indeed, only little more than one-tenth part of it really consists of albumen.

The yolk of egg is by far the most nourishing part, and nearly one-third of it consists of fat. The form in which fat occurs in the yolk of egg is one which makes it very readily digested, compared with many other kinds of fat. Eggs are very rich in phosphorus and in lime and in iron. In all these respects the yolk is much superior to the white. The yolk of egg, therefore, is a very specially good food for people whose blood is poor, and it has no superior for rickety children. In both cases, of course, we assume that it can be digested. No food, except milk, contains so much lime as yolk of egg does, and it is true alike of the lime, the iron, and the phosphorus that they are particularly easily taken in by the body.

The less an egg is cooked, the more easily it is digested. A hard-boiled egg stays in the stomach more than three hours—about twice as long as a lightly boiled egg. Practically the entire food substance in eggs is absorbed by the body—a great contrast with many foods, much of the food substance of which never gets into the blood.

THE BEST KINDS OF FOODS FOR BOYS AND GIRLS TO EAT

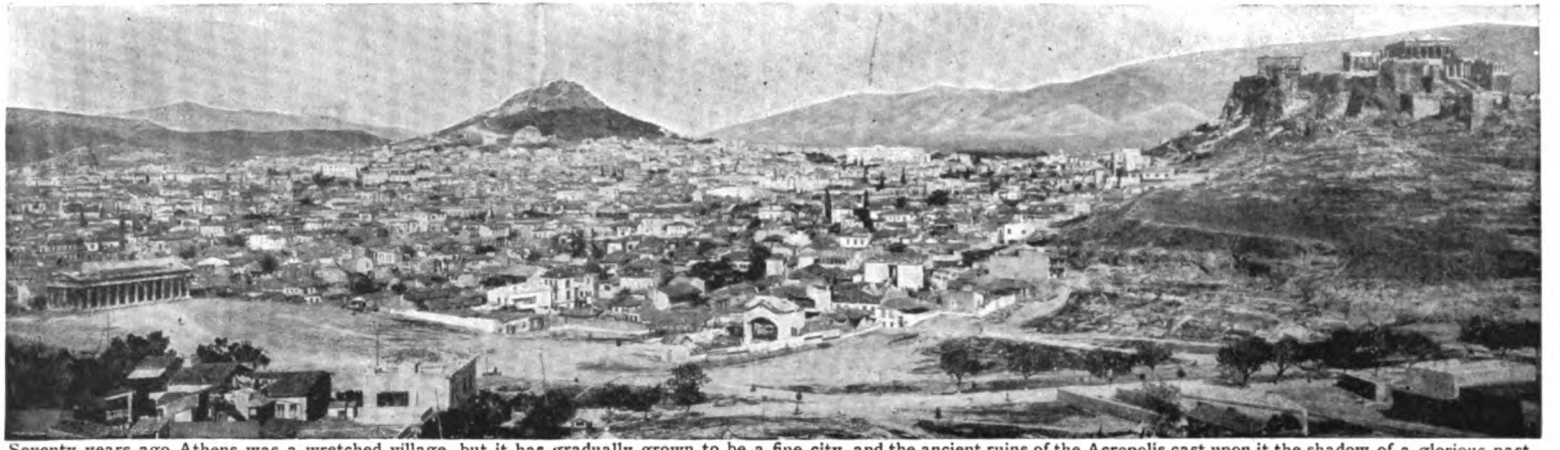
We cannot look upon eggs as cheap, unfortunately. They might, perhaps, be cheaper than they are if their value were better known and the supply were better organised. Like milk, eggs are highly to be recommended for children of all ages, and one may begin giving a little of the yolk of egg to a child after the first year of life. The best sources of proteid for children of all ages are milk first and foremost always; then oats and wheat, eggs, fish, chicken; and, at the bottom of the list, a little lightly cooked meat. Milk and its products, and yolk of egg, are also the best sources of fat that can be found.

It was shown by careful measurement upon a large number of factory children that, "between thirteen and sixteen years of age, they grow nearly four times as fast on milk for breakfast and supper as on tea and coffee."

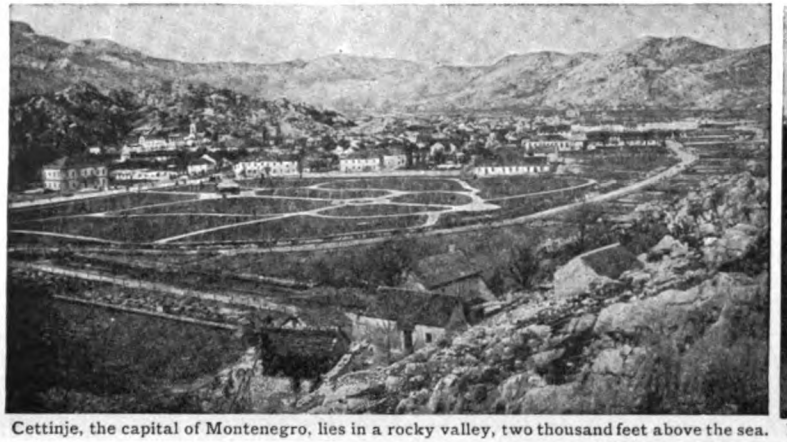
We have now learnt something about the more important foods upon which man depends for the building up of his body. We must next consider some of those substances which we eat and drink, but which are not really true foods.

The next part of this is on page 3315.

ANCIENT CAPITALS OF MODERN COUNTRIES IN THE NEAR EAST



Seventy years ago Athens was a wretched village, but it has gradually grown to be a fine city, and the ancient ruins of the Acropolis cast upon it the shadow of a glorious past.



Cettinje, the capital of Montenegro, lies in a rocky valley, two thousand feet above the sea.

Belgrade, the capital of Servia, was 50 years ago a quaint Oriental city with many mosques.

This picture shows the Sultan of Turkey listening, at the first meeting of the Turkish Parliament, to the announcement of the new constitution which he was compelled to grant to the people in 1908.

TURKEY AND THE BALKANS

GREECE, ROUMANIA, BULGARIA, SERVIA, MONTENEGRO

CONTINUED FROM 3158

WE have seen how the flood of Turkish power spread over the Balkan Peninsula, absorbing the old Eastern Empire, and even over lands beyond the Danube and the Save, and then how the tide turned after the defeat at Vienna near the end of the seventeenth century.

The story of that ebbing tide, and of how the Christian peoples of the various old states and kingdoms have gained freedom from their Mohammedan rulers, is a long and sad one, though there is a happy ending.

All through the eighteenth century, when Western Europe was dreaming of wider life and greater liberties, and a feeling of growth was spreading to its remotest parts, a heavy dead weight of oppression, of almost hopeless sorrow, and fierce hatred between Mohammedans and Christians, between widely differing races, hung over the mountains and valleys of the Balkan Peninsula, and the weight was held down by the jealousies of surrounding nations. It was the work of the nineteenth century to "let go."

Let us turn first to the south, where beautiful Greece lay desolate and ruined by the long mismanagement of both Venetians and Turks. It was during the years of the French Revolution, and when Napoleon was turning Europe into a vast battlefield, that the Greeks determined to fight out their final struggle for freedom to the death. All their efforts to improve the state of their country, to start education, to resist injustice, proved useless, and they were forced into rebellion.

Many heroes rose up as leaders, often fighting like lions against forces much better armed, and in much greater numbers. Such were Marcos Bozzaris; and Constantine Kanaris, who ran a fire-ship into a harbour where lay the Turkish admiral's huge man-of-war. Constantine grappled the fire-ship close to the admiral's vessel, lighted the fuse; but while escaping under her stern in a small boat, he saw that the fire had blown out. Quick as thought he dashed back, relit the fire, sprang into his boat, and as he passed out of the harbour the enemy blew up with a tremendous shock.

Too long Christian Europe looked on at the unequal struggle, allowing their jealousies and their fears that Russia would become too strong if Turkey were weakened to prevent them helping the right cause. At last volunteers went out to help the Greeks, chiefly owing to the enthusiasm of the poet, Lord

Byron, who knew what they suffered and who loved the country and the gallant people. When the Sultan called to his aid a most cruel general from Egypt, the English, French and Russians joined together and destroyed the Turkish fleet in the Bay of Navarino. This was in 1827. When the French landed in the Morea, and hastened the departure of the troops from Egypt, that was the last of Turkish rule in Greece.

THE BUILDING UP OF THE MODERN KINGDOM OF GREECE

The boundaries of the country have since been enlarged to take in Thessaly and more of the lovely islands that fringe its shore, and the difficult work of restoring and building up has gone steadily on. The present king is the brother of Queen Alexandra, and there is a fine constitution by which the people have a voice in the government. By degrees better ways of farming are being introduced, and much care and money is expended in bringing water to parts which are very dry. Most of the land belongs to the peasants who cultivate it, and trade is increasing, chiefly in the currants and other dried fruits, olive oil and sponges, for which Greece is famous. The Greeks, too, do most of the carrying trade in the Mediterranean. There are not many railways yet. Education is becoming more general, and there is a very fine university at Athens, the capital, which lies in a dry basin backed by hills, a few miles from the sea.

There are models of the "Hill of the City," the Acropolis, that towers above Athens in many of our museums, and there are also models of the great ruined building, which stands on its flat top, one of the wonders of the world. This is the Parthenon, the temple built more than 2,000 years ago for the worship of the goddess Athene, after whom Athens is named.

A PAGAN TEMPLE THAT BECAME A CHURCH AND THEN A MOSQUE

When Greece passed under the Christian emperors, the Parthenon was used as a Christian church. In the times of the Turks it became a mosque, and it was a Venetian bomb which reduced it to the state of ruin in which we see it now. A fine modern city, built of marble from a hill near the one which supplied the blocks for the Parthenon, has risen up below the hill and its ruins, which thousands of visitors come every year to study and enjoy.

Between the lower Danube—often ice-bound in winter—and the sweep of mountains formed by the Carpathians and the Transylvanian Alps, the two provinces of Moldavia and Wallachia were united to form Roumania about fifty years ago. This step came after long and sore trials and sufferings, similar to those endured in Greece. A good constitution was arranged to give the people rights in their government, and a prince was chosen; but they were still under Turkey to some extent. The representatives of the people declared their independence from the Turks in 1877, and a little later Prince Charles became King of Roumania.

In the capital—Bucharest—is a statue of the noble Queen of Roumania, Elizabeth, giving drink to a wounded soldier, a memorial of her goodness in the terrible war with the Turks that brought independence.

A NOBLE QUEEN WHO HELPED IN ROUMANIA'S FIGHT FOR FREEDOM

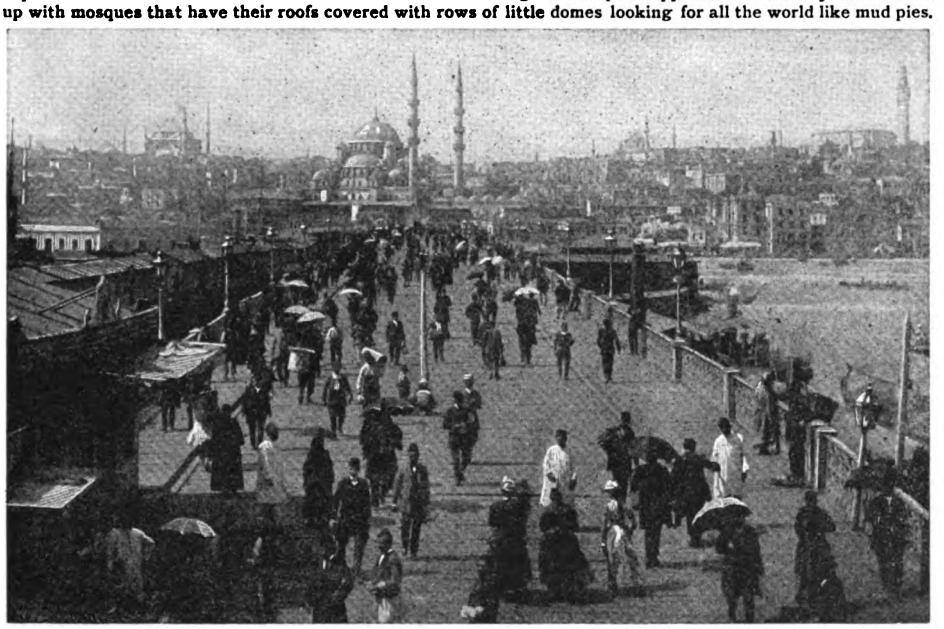
She earned then the title of "Mother of the Wounded." Her stories of her adopted country, of the sorrows of the convicts in the salt mines in the Carpathians, of the slavery of the farm servants in the wide plains of waving corn, of the hot spirit in which injuries are revenged, all help us to understand life in this country, nearly as large as England and Wales, and also to realise to what a state the Turks had reduced it.

It is a flourishing country now. The Danube and other rivers make splendid waterways by which to convey the stores of golden grain from the fields, and the minerals, metals, oil, salt, and coal from the mountains. Railways are progressing, and Bucharest is a busy trade centre, as are also the ports on the Danube and the Black Sea.

Bulgaria lies south of the Danube. The ruins of the palaces of its old rulers show what was their magnificence a thousand years ago. Rulers they were who sat decked out with pearls and diamonds and gold chains, on an ivory throne ornamented with gold and blazing jewels, in a palace adorned with marble pillars and mosaics. After the Russians invaded Bulgaria in the twelfth

CONSTANTINOPLE, THE KEY OF THE EAST

Constantinople, built, like Rome, upon seven hills, is of such importance that all nations covet it. It is picturesque and dirty, but the old, insanitary, narrow streets are becoming fewer and fewer. This picture of the Turkish capital shows the varied character of its architecture. Buildings of European appearance are everywhere mixed up with mosques that have their roofs covered with rows of little domes looking for all the world like mud pies.



The Golden Horn, an arm of the Bosphorus, divides Constantinople into two parts. On one side is Stamboul, the old city where the Turks live, and on the other side Galata and Pera, inhabited mostly by Christians and Jews. Two bridges of boats join the old and the new cities, and one of these, the Galata bridge, is shown in this picture. We are looking from the Galata side of the city, across the Golden Horn, at Stamboul.

The photographs of Athens and Cettinje on page 3218 are by the Photochrome Ltd.

century, the races mixed very much, and ever since, during the 500 years in which Bulgaria suffered so greatly under Turkish rule, Russia has shown much sympathy in helping it to freedom.

Things came to a terrible pass about forty years ago, when the Turks massacred men, women, and children after every rising against Turkish cruelties. Mr. Gladstone, in England, roused public opinion; and finally Russia went to war with Turkey in defence of the people who were of the same religion and largely the same race as herself.

THE BATTLES IN THE BALKANS THAT SET BULGARIA FREE

Heroic campaigns were fought in the passes of the Balkans in 1877 and 1878; and, finally, by a treaty signed at Berlin by Russia, Turkey, Austria, and England, it was agreed that Bulgaria should be a principality still under the Sultan, but with a Christian government and a prince to be elected by the people. The province the other side of the Balkans—Eastern Rumelia—was to remain under the direct authority of the Sultan; but this arrangement was overthrown by a revolution a few years later, and Rumelia united with Bulgaria.

A great deal of corn is grown in the wide fields, and many cattle and sheep are reared on the slopes of the wooded Balkans; agriculture is improving, as in Greece, and small estates are the rule, worked by their peasant owners. There is plenty of convenient water power, and coal and ores in the mountains, all capable of development. Bulgaria is famous for embroideries and for the scent known as attar of roses. The decisive battle of Shipka, in 1877, was fought in the midst of the rose-gardens, of which there are some thousands of acres on the sunny slopes of the valley of the Maritza River.

THE LIBERATOR OF BULGARIA AND THE PRINCE WHO MADE HER A KINGDOM

Alexander II. of Russia is often called the Liberator of Bulgaria, and in the capital—Sofia—we find a monument to him, and a street named after Gladstone.

A bright, cheerful scene it is in Sofia, with the gay uniforms of the soldiers and the picturesque dresses of the peasants. These are best seen at the early morning market, when they bring their fresh produce in for sale. Fruit is very plentiful, and wine is made from the produce of the vineyards. Varna, on the Black Sea, is Bulgaria's chief port. Prince Ferdinand declared himself tsar, at the end of 1908, without the consent of Turkey or the other Powers who signed the Treaty of Berlin.

Servia is Bulgaria's neighbour on the west. It was once a much larger country than it is now, in the basin of the Morava River. At the beginning of the nineteenth century the country had a good Turkish Governor, but the fierce Janissaries put him to death, saying he was no friend of the Sultan's, and they then proceeeded to murder all the Servians who could be looked upon as leaders. Amongst the few who escaped was the leader called Black George, son of a peasant, and to him the country owes the independence which came to it by degrees. He organised a constitution and schools. He is deservedly looked upon as a national hero.

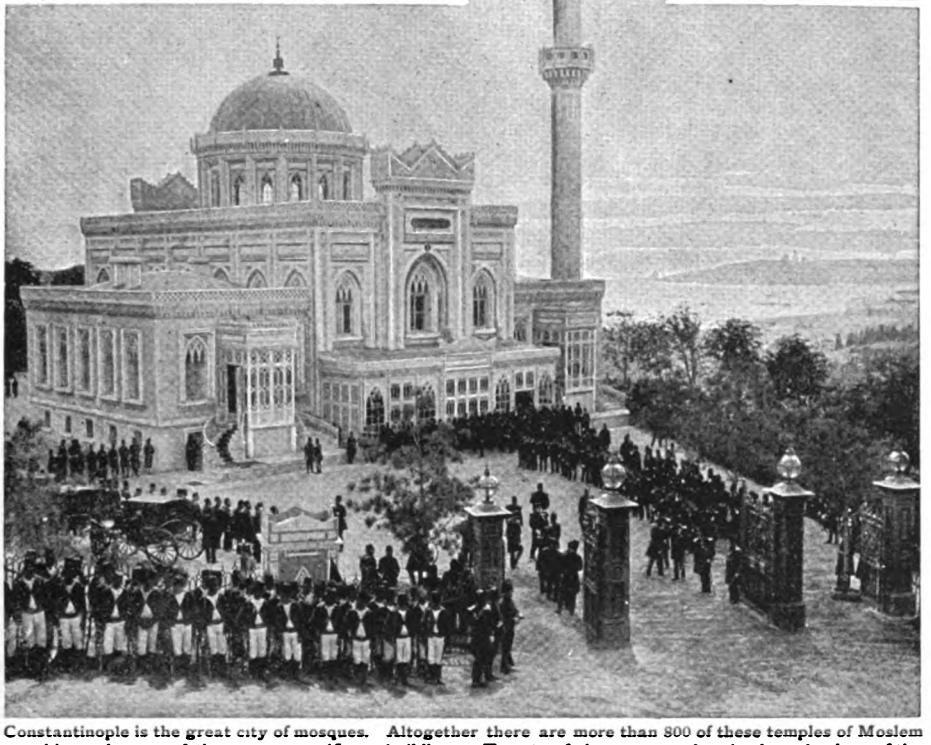
Belgrade, the capital, is situated where the Save and Danube meet, and has all through history been hotly fought for over and over again as one of the most important "gates" of central Europe. It is interesting to see the Hungarians who come across the Save to the market in Belgrade in their national costumes; their butter, cheese, and vegetables are of the best. At the Servian end of the market are splendid grapes and plums.

SERVIA, THE LAND OF LITTLE FARMS WHERE THERE ARE NO WORKHOUSES

Agriculture is prospering, and a good deal of wheat being grown. There are no large estates in Servia, but every peasant cultivates his own land, and there is no need for workhouses. There are beautiful highlands in Servia, and in the Morava Valley are fine forests of oak and beech, in which great numbers of pigs feed. A great deal of Servia's trade is with Austria-Hungary, by way of the Danube and its tributaries. Servia much desires certain lands and ports for its development, which Austria is unwilling to grant, and great forbearance is needed to soothe ruffled feelings and keep the countries of the storm-centre of Europe at peace.

Bosnia and Herzegovina are two small provinces to the west of Servia, with the Save on the north and the Dinaric Alps separating them from the beautiful coast of the Adriatic on the east. For 400 years they were part of the Turkish Empire, during which

OLD MOSQUES & NEW AT CONSTANTINOPLE



Constantinople is the great city of mosques. Altogether there are more than 800 of these temples of Moslem worship, and many of them are magnificent buildings. Twenty of the mosques date back to the days of the Byzantine Empire, and were originally Christian churches. In the two pictures on this page we have the old and the new types of mosque. Above is the great mosque built by the Sultan Bayazid at the beginning of the 16th century, and below we see the beautiful Hamidieh mosque built by the present Sultan in 1886. It is opposite his palace, and the picture shows how the troops guard the mosque when the Sultan goes to prayer.

time they seem almost to have disappeared from civilisation. At last the exasperated people rose against their oppressors in 1875; and at the Treaty of Berlin, after the Russo-Turkish war, they were handed over to Austro-Hungary to be managed by her for Turkey. The people were promised equal rights before the law, and protection in life, property, and worship.

THE BEAUTIFUL LANDS OF CORN AND FRUIT THAT AUSTRIA SEIZED

An immense change for the better is to be seen in this beautiful mountainous country of high peaks and deep glens. On the hills are a series of terraces sloping down to the lovely Adriatic coast of bays and islands, on which grow fruits of various kinds, and rich crops are raised in the valleys. Caravans of carts go along the improved roads full of produce for the railways, which have been built at immense expense in the wild country. As travellers pass through the tunnels, over the gorges, by the sides of steep precipices, they are reminded of the passage of the Rockies in North America. Here, too, though on a smaller scale, are roaring foaming streams, great gardens of fruit trees, and snowy peaks cutting the blue sky.

Austria had promised not to do anything to alter the footing on which Bosnia and Herzegovina were governed, but Europe was surprised in October, 1908, by Austria suddenly adding the two provinces to her own dominions without asking the permission of the Turks.

Montenegro, about half the size of Wales, is a little, mountainous country, with many dark pine-woods on the slopes. Its inhabitants, like other mountaineers, the Swiss, the Scots, the Welsh, have always been famed for their bold spirit and energy and for the amount of freedom they have managed to retain.

THE BRAVE PEOPLE OF A LITTLE COUNTRY WITH A LITTLE CAPITAL

Tilling the fields in the valleys and tending flocks on the mountain sides are the chief occupations of these brave, handsome, kindly people. Here is no noise and bustle as in most countries. There is but one short railway at present, leading from the port of Antivari on the Adriatic to the Lake Scutari. There is a wonderful zigzag carriage road from the roomy and beautiful harbour of Cattaro—which belongs to Austria—to the tiny capital, Cettinje, where the prince holds his court. Half of Lake Scutari is in Albania, which, with the old provinces of Kossovo, Macedon, and Thrace, make up to-day the Turkish dominions in Europe; they have shrunk to the central part of the peninsula over which they once held full sway. Many races make up their population of six millions, the most numerous being the Albanians, Greeks, Bulgarians, and Serbs. There are not a million Turks in Turkey proper.

Turkey, having for so long been a badly governed country, is in many ways behind the times. Education is backward, farming is scarcely understood, though three-quarters of the people spend their lives cultivating the soil. The fertile land and good climate make up for deficiencies to a certain extent, and Turkey sends away raisins and figs, wheat, olive oil, raw silk, attar of roses. Among other things, morocco leather is manufactured, and some metal is worked. There are no canals in Turkey proper, and the rivers are not navigable with the exception of the Maritza to Adrianople.

CONSTANTINOPLE, THE WONDERFUL CITY OF MOSQUES AND MINARETS

It is only of late years that railways have been made joining Turkey with the rest of Europe, with some branch lines to important ports on the Black Sea and the Sea of Many Islands. We can now reach Constantinople by the Orient Express in about seventy-two hours from London, passing cities whose names we so often meet with. Vienna, Buda-Pesth, Belgrade, are all on the main line to Constantinople.

But the more beautiful way to approach this wonderful city is by sea. Steamers from all parts come to the port of Greece, to the islands, to Constantinople, and the Black Sea beyond; ferry steamers ply across the Bosphorus as they do over the Hudson, between New York and Jersey City. Buildings of all kinds lie on the rising slopes, fine houses and palaces shaded with trees are everywhere, even down to the water's edge; and beyond them are the countless domes and minarets, or spires, of mosques. The ruins of the grand walls running from the Golden Horn to the Sea of Marmora, remind us of the old sieges and attacks through the centuries. Let us stand on

MEN & WOMEN OF THE BALKAN COUNTRIES

This is a young Servian woman of the Greek Orthodox Church, the religion that most Servians profess.

The picturesque national costume of Montenegro is shown in this picture of one of the prince's bodyguard.

The people of Albania were formerly all Christians, but many of them, like this man, are now Mohammedans.

This is a Servian woman belonging to the Roman Catholic Church, as indicated by the way she dresses.

The sailors of the Greek seas are very unlike our ideas of what a sailor should be. This is a mariner of Cos.

This is another type of Albanian warrior, and shows the curious kilted costume worn in the south.

There are many Albanians who still remain Christians, and here we see a Roman Catholic lady of Albania.

The people of Bulgaria, as shown in this picture, are a fine type. Elementary education is compulsory.

This is a typical peasant woman of European Turkey in the quaint costume she wears on gala occasions.

The Macedonians have often revolted against their Turkish rulers. Here we see a Macedonian shepherd.

The Bosnians, of whom this is a type, have much in common with Servia, but they are now Austrian subjects.

The Bosnian women wear a picturesque costume, an important part of which is the many-coloured sash.

the bridge over the harbour of the Golden Horn, which connects the old city of Constantine with the suburbs where Europeans chiefly stay. At Hamburg and Marseilles we have watched crowds of sailors of different nationalities; but here on the quays we are quite bewildered by the numbers of races, and costumes, and languages, for the city is still the centre of a very large trade.

Looking towards Asia, we see another suburb, Scutari, where there is an English cemetery; and in the straits are ships of every description, sailing under the flags of every nation in the world.

THE SULTAN WHO SHUT HIMSELF IN HIS PALACE AND MISGOVERNED HIS EMPIRE

The Sultan Abdul Hamid II. lived in a palace, like a town for size, beyond the European quarter of Pera. For years he was guarded and lived apart from his subjects, only coming into the city on rare occasions, and going to a mosque close to his palace every Friday to pray. It is difficult to realise how much power could be centred in the grasp of one man. It included absolute power of life and death over all subjects, absolute control of the finances of the country, and absolute tyranny in preventing freedom of the Press or of speech. A whole army of spies were kept busy reporting to the shut-up ruler what was going on in the different parts of his kingdom.

But in spite of the spies, and their lies and their cleverness, a great movement was going on quietly in Turkey for some years, before they knew much about it. Many of the best Turks were ashamed of the state of things in their country, and formed themselves into a society to try to devise a plan to better them. Some had to go to Paris for safety, some lost their lives on suspicion of holding liberal and new views. But their numbers grew, and no one betrayed the secrets they had sworn to keep.

THE REVOLUTION THAT CAME IN A NIGHT AND TRANSFORMED TURKEY

Much devoted work was needed to organise the society when its numbers rose to thousands, and to convey the necessary knowledge to suitable people and to make definite plans for action when the right time came for a revolution. What they wanted to do was to take all the power out of the hands of one man, who had so long paralysed the country and had brought it to disgrace before the countries of Europe, and to gain a constitution—one that would last; for some years before one had been granted and soon withdrawn. They wanted, too, that there should be a fair system of electing members to a Parliament that should settle the affairs of the country. It is easy to see that it was most important that the Young Turks, as the reformers were called, should have the army with them; so most cautiously and carefully, sometimes disguised as pedlers and barbers, the agents went about gaining the soldiers, and slowly things were ripening.

At last, in the month of July, 1908, in fear that the country would be humiliated by European reform, secrecy was laid aside, and the long-prepared blows were struck. Enver Bey, the head of the movement in Salonika, rushed through the villages preaching the revolution. Niazi Bey raised the standard in the interior, and the Macedonian Army Corps having been gained as well as the battalions from Asia, the Committee of the Young Turks felt strong enough to demand from the Sultan the acceptance of the constitution within twenty-four hours.

HOW THE OLDEST PARLIAMENT SENT CONGRATULATIONS TO THE YOUNGEST

The Sultan gave way. A constitution was granted, a proclamation made, a Parliament was ordered to be summoned, and so the revolution, one of the most amazing in history, that transformed the whole character of the government of an empire, and changed the traditions of centuries, was effected without bloodshed.

It was a wonderful sight when the Sultan went through Constantinople to open the new Parliament. But it was found that a constitution did not make everybody rich and happy, and friends of the Sultan stirred up discontent. In April, 1909, the soldiers in Constantinople who preferred the old ways rose and drove out the Parliament. The Young Turks were not discouraged, but at once marched to the city. Within a week order was restored. Parliament declared that Abdul Hamid was no longer the Sultan and raised his brother to the throne as Mohammed V.

The next story of Countries is on 3351.

THE CRUST OF A FIERY FURNACE

MOUNTAINS, GLACIERS, EARTHQUAKES, & VOLCANOES

CONTINUED FROM 3077

WE read of the contrasts between deserts and forests on page 3071. Anyone making his first acquaintance with the face of the earth might think other things more striking than even deserts or forests, but we have learnt to think of the earth as owing all its meaning and value to life, and we have learnt that, from this point of view, the contrast between deserts and forests is the most important that the earth can show.

Perhaps the mountains are the objects that would most strike an observer, apart from the question of life—mountains and valleys and inland cliffs and what are called canyons. Cliffs on the seashore we already understand, we can watch the sea doing its work upon them almost any day; but we know that there are cliffs far from the sea, and mighty valleys which look as if they had been suddenly scooped out by some tremendous deluge of water. So first let us study these great ups and downs on the dry land.

Probably we are only just beginning to get a real understanding of the making of mountains. At any rate, we may be sure that the process was a gradual one. We may also be sure that the cooling and shrinking of the interior of the earth is one of the great underlying causes in the making of mountains. The view which is generally held—though we are beginning to suspect that it is probably not the whole truth—is that mountain ranges are formed by the crumpling of the earth's crust as it tries to fit itself to the shrinking interior. We see on page 407 a picture which very beautifully suggests how the crust may be supposed to have crumpled in three great lines running from north to south, those lines being represented by the three great mountain chains of the world.

Then, we are now beginning to believe that the marvellous element, radium, which is found everywhere, may possibly, by the power which it produces from inside itself, have had a share in the building of the mountains. But it is impossible to say more about that yet. Let us turn to the places where the dry land, instead of being piled up, is scooped out. Until the first half of the nineteenth century, men always supposed that valleys had been made suddenly by some mighty disturbance, like a great deluge. When we do not see the slow steps of a movement, and when they act for

such long ages that the mind cannot appreciate the length of them, we fail to understand how great are the changes they can produce. When it was first taught that long lines of inland cliffs and mighty valleys had been formed, not suddenly, but by the slow working of agencies which are still at work, like wind and water, the students of the subject found it impossible that this could be, but now no one questions it. The discovery of the truth was the work of one of the greatest geologists, the Englishman, Sir Charles Lyell, who, like many other great men, was abused during his lifetime, but whom all students of the earth will always honour.

There was a time when a great part of the United States was under ice; indeed, that has been true throughout more than one past period of history. No one yet understands the real cause of the Ice Ages, and it will be best not to attempt to explain them. Probably, in a very few years, we shall learn how they came about. But, at any rate, we must know, when we study the mountains, that there were Ice Ages; and it is specially interesting to know that the Ice Ages were quite recent, as time goes in geology.

How mountains and boulders tell us of the story of the earth

Charles Darwin says: "The ruins of a house burnt by fire do not tell their tale more plainly than do the mountains of Scotland and Wales, with their scored flanks, polished surfaces, and perched boulders, of the icy streams with which their valleys were lately filled." In many parts of Europe we can study the action of ice upon the mountains even at this day. On page 409 we see a picture of a stream of ice flowing down a valley from an ice-covered mountain. These streams of ice are called glaciers. In very cold parts of the world we can find a glacier running right down to the level of the sea; but elsewhere, as, for instance, in Switzerland, of course we can only find the ice at a much higher level, say, four or five thousand feet above the level of the sea. In Greenland, for instance, as the ice of a glacier breaks at sea-level, it will form icebergs; in Switzerland, when the ice of a glacier breaks, it may tumble down the mountain, and form what is called an avalanche.

When we talk of a stream of ice, people may say: How can ice flow, and at what rate does it flow? Well, we may say that the rate of flow is a few feet each day, and the central part of the glacier moves more quickly than the sides because they are held back by the friction of the rocks between which it flows.

The wonderful reason why a river of ice flows for ever onward

The same is true of any river, and we can also see exactly the same when we watch the blood flowing through a blood-vessel. The reason why the ice flows, as it does, is now understood. The weight of the ice makes it fall, and it is, of course, pressed upon by snow from above; but the glacier could not flow as it does were it not for the fact that when ice is pressed very hard it is melted, and then, when the pressure is removed, it freezes again.

So, as the glacier moves down, any obstruction in its way causes part of it to melt, and so flow over; and then, when the obstruction is passed, the ice freezes again. This curious property of ice can be shown with a block of ice and a piece of wire, which can be pulled right through the ice and yet leave a solid block behind. The pressure of the wire causes the ice to melt, and then, after the wire has passed, the ice freezes again. The ice that forms the glacier comes from the snow on the mountain heights. As this snow is squeezed and pressed, it turns into ice.

We need say no more about avalanches, except that they are not always made of ice. They may sometimes be made of snow, such avalanches being commoner in spring, while those of ice, which are broken off from glaciers, are commoner in summer. We are always to remember that icebergs are broken off from glaciers in parts of the world so cold that the glaciers can run right down into the sea. But when we see a picture of an iceberg, we should remember that only very little of it is visible.

The huge mountains of ice that float in the sea

Only one-eighth or one-ninth part of an iceberg floats above the level of the water; all the rest is underneath it. So when sailors see, as they sometimes do, an iceberg which shows as much as 300 feet above the level of the water, we can get some faint idea of what a gigantic thing an iceberg may actually be.

Ocean currents may carry icebergs from the Arctic region far enough south to cross the routes of steamers, and occasionally Arctic animals have been seen carried south upon the iceberg in this fashion. If the warm water melts the buried part of the iceberg, it will capsize.

A WORLD THAT HAS HAD ITS MOUNTAINS RUBBED OFF

Glaciers and avalanches and rain, snow, frost, and air are always tending to rub away and smooth down the mountains. When we study the surface of a world which, in many respects, is very like our own, but is in a much later stage of its history, we can learn what happens to mountains. Our neighbour, Mars, has no mountains. We can be certain of this, since it can be proved that even very small mountains, if they were present, would be visible by modern telescopes. Night after night the astronomer may watch the edge of Mars, and never find a hint of a mountain. If there were anything as high as about 2,000 feet on Mars, it would be visible. Now, it may be that Mars never had mountains so large as the largest mountains on the earth, but the chief reason why Mars is now so smooth is probably that its mountains have become rubbed down and its surface smoothed out, as is probably happening now in the case of the earth.

Volcanoes are very special kinds of mountains, made in a special way. All volcanoes have the same shape, this being due to the fact that they have all been formed in the same way, by the gradual gathering of stuff which has been thrown out from the interior of the earth. Volcanoes are found in many parts of the world, some of them being still active, while others have never been known to throw up anything within man's memory. The hole in the centre of a volcano we call a crater.

THE HOLE IN THE EARTH THROUGH WHICH THE FIRE FROM THE FURNACE MAY COME

There are no large volcanoes on Mars; the moon is covered with objects which look like volcanoes, but some astronomers are now beginning to suggest that they are not really at all the same as the volcanoes of the earth, but were made by great meteors striking the moon. As the question is doubtful, we will say no more about it now. A volcano begins as a hole in the earth, more or less suddenly formed as the consequence of an earthquake. Recently a traveller had the good fortune to witness the actual birth of a volcano.

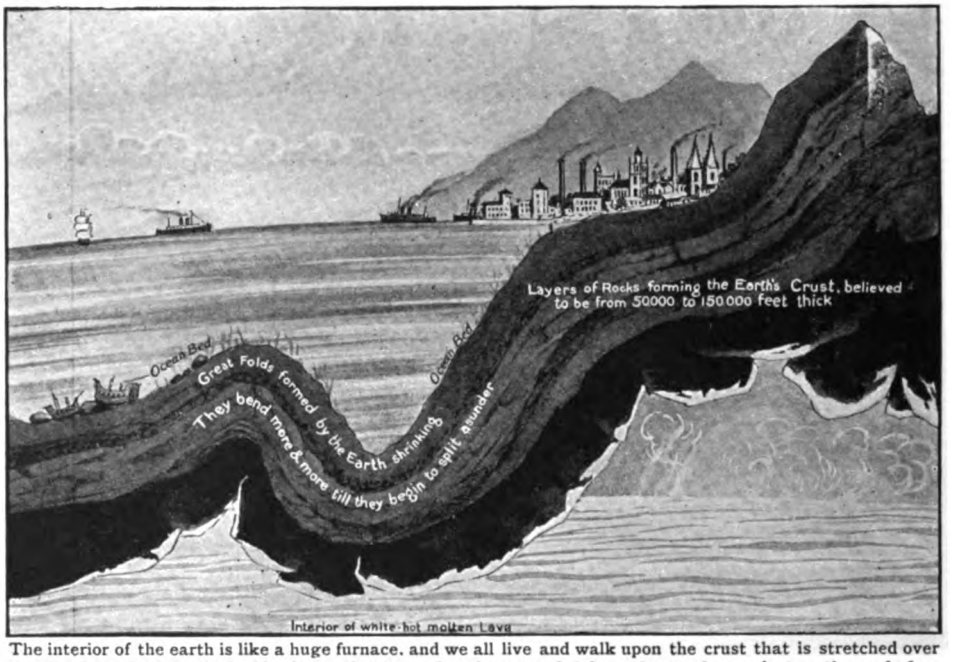
Through the hole or crack which is made in the earth there pour steam and a great many chemical substances, some of which strongly suggest that sea-water has been at work. Now, volcanoes commonly occur near the sea, and perhaps some earthquake under the sea admits sea-water to deeper levels, where it is turned into steam, and then perhaps forces its way out through the dry land, forming a volcano. We should also expect to find volcanoes in parts of the world that are liable to earthquakes, and, of course, we all know that Mount Etna, one of the most famous volcanoes in the world, is in Sicily, which is very liable to earthquakes, and has recently suffered from the most terrible earthquake of which we have record in history.

We do not yet know how and why a volcano should be quiet at one time and active at another, nor yet why volcanoes become extinct; but we do know that, owing to some cause or other, which probably really is the admission of water to the hot levels of the earth's crust, volcanoes pass into eruption, throwing out gases, liquids, and solid matter, all of which are intensely hot, and some of them actually burning.

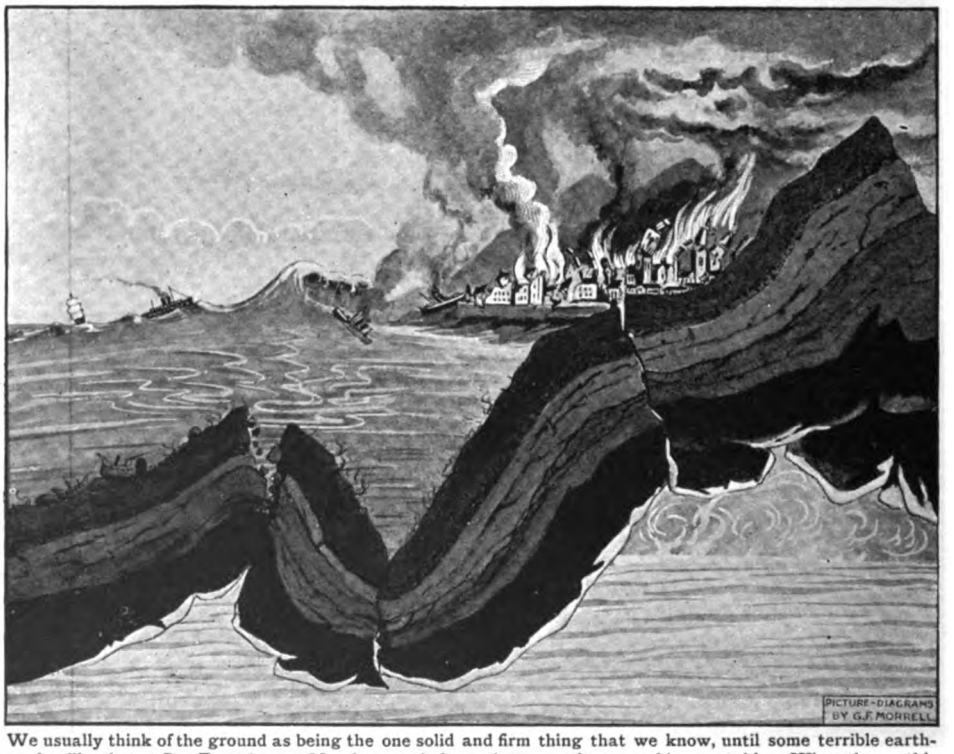
A GLOWING RIVER OF MELTED ROCK RUSHING DOWN A BURNING MOUNTAIN

After the first eruption, the stuff which is called lava begins to flow, often at several points, down the side of the volcano. Lava is simply a general name for melted rock running out of a volcano, and a very large number of different kinds of rock are found in lava. The melted rock is said to run somewhat as honey runs, and varies very much in its speed. A stream has been observed to travel at the rate of nearly a mile a minute, but that was very exceptional. When the melted rock first flows, it is white hot, then it becomes red hot, and finally black, not unlike cinders. Pumice-stone is really a kind of lava; it is the gas-filled froth of the lava stream. Another kind of lava is dark, and looks like glass, and has the special name of *obsidian*; this is quite a beautiful substance. It is extremely interesting to discover evidence of radium in the products of volcanoes. All this part of our

THE SPLITTING OF THE EARTH'S CRUST

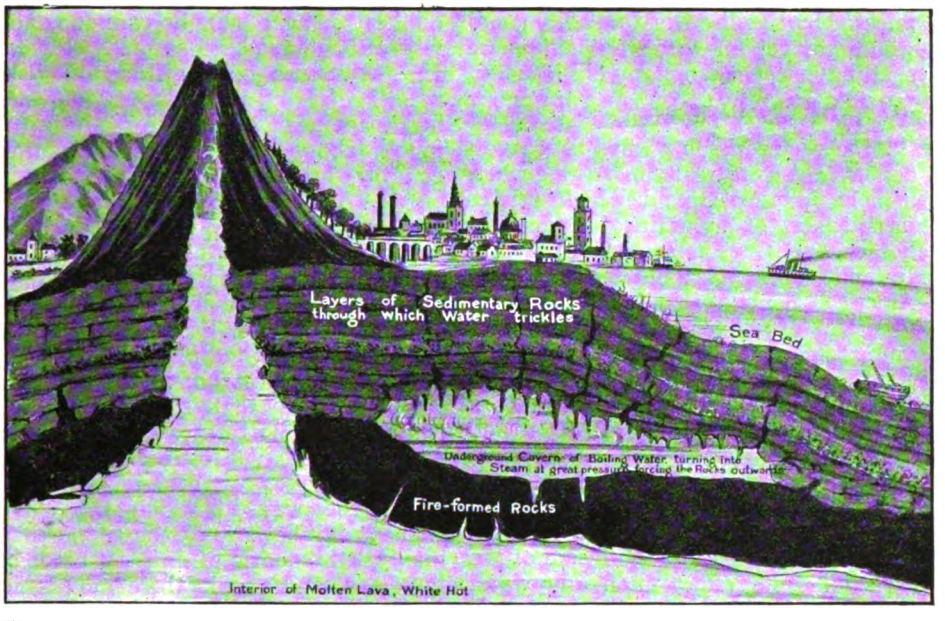


The interior of the earth is like a huge furnace, and we all live and walk upon the crust that is stretched over it. **As the molten matter inside the earth gets cooler, the crust shrinks and crumples up, just as the peel of an orange shrivels when the orange gets dry. By this wrinkling the mountain ranges are formed, as shown here.**

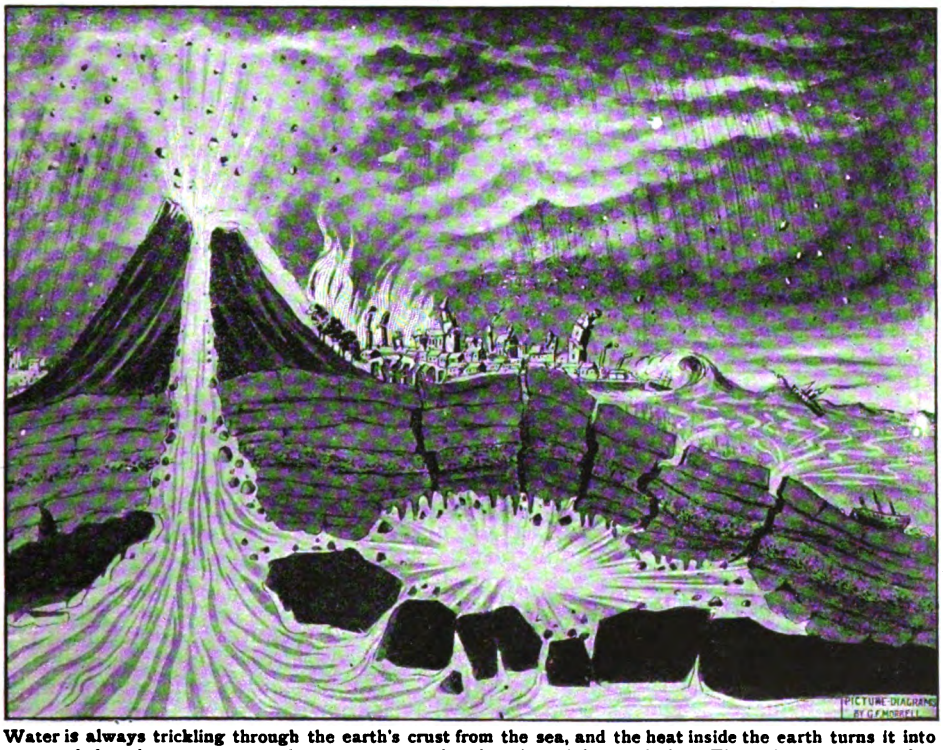


We usually think of the ground as being the one solid and firm thing that we know, until some terrible earthquake, like that at San Francisco or Messina, reminds us that even the ground is not stable. **When the earth's crust at any point wrinkles so much that it is unable to bear the strain longer, the rocks split, as shown here, and the shock sends a shiver through the earth for hundreds of miles, causing buildings to shatter and fall.**

HOW FIRE COMES OUT OF THE EARTH



The pictures on this page show us at a glance one of the causes of volcanic eruptions and earthquakes. It is as though we were behind the scenes and could see the machinery by which Nature performs her most awful spectacle. This volcano is asleep, but processes are going on that will sooner or later cause a catastrophe.



Water is always trickling through the earth's crust from the sea, and the heat inside the earth turns it into steam. At last the steam pressure becomes so great that there is a mighty explosion. The rocks are rent asunder, and the molten lava from the interior of the earth, with boiling mud, is hurled forth in a fiery stream. The rending of the rocks, too, causes an earthquake. This is probably how the eruption of Mount Pelée was caused.

subject has been already greatly affected by the discovery of radium, and we do not yet know to what extent we shall have to change many old ideas.

WE LIVE AND WALK ON THE THIN CRUST OF A FIERY FURNACE

A geyser is in some ways like a volcano. The word really means a gusher, a hole in the ground which gushes forth a sort of fountain of steam and hot water. Geysers are best known in Iceland, New Zealand, and North America. Some of them throw up great fountains of water at regular intervals, and as the water contains a great many salts dissolved and melted in it, these salts are often left behind, and turn solid round the geyser. In this way something is formed which is really just the same as the crater of a volcano, though it is very much smaller. In both geysers and volcanoes we have to reckon with the great heat of the inside of the earth, and its effect upon any water that reaches it. We all live and walk upon a thin crust stretched over a tremendous furnace always on fire.

No wonder, then, that earthquakes are possible. But just because we know so little of the depths of the earth, it is very difficult for us to understand the causes of earthquakes. What we call the solid earth is always more or less in movement. The children playing on the hill near Greenwich Observatory are quite sufficient to shake the hill so that the astronomer's instruments are interfered with. But even the effects of the weight of heavy rain, or the influence of frost, will cause movements in the earth's crust; and delicate instruments easily detect these movements. Then, of course, a landslip down the side of a mountain, or the fall of an avalanche, will shake the earth to a great distance.

THE ENGLISHMAN WHO MADE MACHINES TO MEASURE EARTHQUAKES

All this means that the surface of the earth's crust is exposed to a great many kinds of disturbance acting on the *outside* of it. But true earthquakes, we know, are due to forces acting on the *inside* of the earth's crust, and it is these that may do tremendous damage. They are specially common in certain parts of the world. Though slight earthquakes occur in Europe, their case is very different from that of Japan, where earthquakes are exceedingly common, and where they have been specially studied. Indeed, it was not until an Englishman, Professor John Milne, began work in Japan in 1875 that we really learnt much about earthquakes. In that country, as he tells us, "at certain seasons of the year I might have them several times during the day, and not infrequently during the night." At that time there only existed instruments which showed that an earthquake had happened, but now Professor Milne and others have invented instruments which can measure the size of earthquakes.

This means that students of the subject are able to measure the forces which they have to reckon with in building houses or bridges. Having learnt the way in which the earth shakes during an earthquake, they made little models of different kinds of buildings, and shook these models in just the same way, in order to find out which kind of building stood best. It has been shown also that certain kinds of ground are more affected than others. It is better to build upon hard than soft ground, and to keep away from the edges of cuttings in the ground.

HOW EARTHQUAKES HELP MEN TO LEARN THE LAWS OF GOOD BUILDING

Professor Milne says: "After this, remember there are two types of structure you can put up. One may be compared with a steel box, and the other with a wicker basket. You can kick either of them about, and both will withstand the trials to which they are subjected. . . . It does not matter whether it is the steel box built for the rich, or the wicker basket built for the poor. If you have a good site, no earthquake which has occurred in historic times, unless the ground opens beneath your feet, can do more than disturb the ornaments on your shelves and the plaster on your walls."

At the Naval College, Osborne, in the Isle of Wight, there is a village built on these principles. We do not yet really understand earthquakes, but the study of the last thirty years has taught us what is in some ways more important; that is, how to protect ourselves from the damage to buildings and the terrible loss of life that earthquakes cause.

The next part of this is on page 3339.

CAN A SOUND BE FELT?

CONTINUED FROM 3096

WHEN we come to think of it, we shall see that hearing is, after all, only a special kind of feeling, and so also are smell and taste and sight; but when we say, "Why cannot sound be felt?" we mean, "Why does it not affect our sense of touch?" The answer simply is that almost all sounds are too delicate a movement of the air for our sense of touch to feel. Otherwise, there is no reason, of course, why we should not feel them. In some people, whose brains are not quite well, any or all of the senses may become far more acute than they usually are, and such people can do things which it is very difficult for us to believe until we study the subject. Some of these people can apparently feel certain sounds with their skin; only, of course, they do not feel it as sound, but as a trembling movement in the air. The very lowest sounds can be felt as well as heard by ordinary people. The lowest pitched sound that we can hear is one made by about fourteen to-and-fro vibrations per second. It is possible to make a large, long, heavy tuning-fork which, when it is hit hard with a drumstick, will vibrate at this very slow speed. If a person's hearing is quite healthy, he can just hear this as a very faint and deep note; but it is quite easy also to feel the waves of air that it makes—that is, to feel them by the sense of touch just as they can be felt by the sense of hearing.

ARE THERE SUCH THINGS AS GHOSTS?

There are many things in the world which we do not know, and no one has the right to deny that there may be thinking and intelligent beings of whom we know nothing. But it is quite certain that there are no such things as ghosts.

In all ages a certain number of people have believed in ghosts, and this is not difficult to understand, since we know what tricks our brains may play us. In certain states the brain may quite easily make us think we see things that are not there, or hear voices which do not really exist. These mistakes have a long name which does not matter. I believe they are much commoner than we usually suppose, because most of the people whose brains make these mistakes say nothing about them. Also, if people believe in ghosts, it is very easy for them to think they see a ghost, when

what they see is something else which they mistake for a ghost. This belongs to another class of brain mistake—in which there is really something there, but it is not what we think it is. In pictures or descriptions of ghosts, we find that they always wear some kind of clothes. That one thing is enough to show how absurd the belief is. In any case, our souls, or ourselves, are not material things having the same shape as our bodies, but even if they were, what could be more absurd than to believe that there are such things as the ghosts of clothes?

SHOULD WE SEE THE WORLD GO ROUND IF WE STOOD STILL IN A BALLOON IN THE SKY?

Yes; and we should have a wonderful spectacle beneath us, for we should see the earth spinning under our eyes at a pace twenty times as quick as an express train. Also, if we went up in the daytime, the night would not come; and if we went up at night, the day would not come; for, whatever our position was in relation to the sun, there we should remain. But all this is quite impossible for a balloon which floats in the air, for the air is carried round with the earth, and the balloon must go round too.

It would be possible in an airship which could travel as fast through the air in the opposite direction as the air travels with the earth; as fast as the earth and the air spun one way, the ship would beat against them. So, of course, it could remain in really the same place, and the people in it could see the earth travel underneath them. But the earth is 25,000 miles round, and spins completely round in twenty-four hours, so the airship would have to be able to move at a tremendous pace, about ten times as fast as the fastest motor-car.

WOULD THERE BE ANY WEIGHT IN THINGS WITHOUT THE EARTH'S PULL?

The answer to this is practically no. What we call the weight of things is the earth's pull for them; and if the earth were to lose its power of gravitation, it would be just as easy to lift a house as to lift a little ball. The amount of matter in things would be just the same as it was before, only they would have lost their weight, or heaviness. So, when we mean to talk about the amount of matter in a thing, it is very much better to use the word "mass" than to use the word weight. The mass of a thing is wholly independent of gravitation, but the weight of a thing wholly depends on gravitation, and cannot exist without it. The mass of a thing is the same whether it be on the earth or the sun or the moon, but its weight would be vastly different in those three cases.

I said that the answer to the question was practically no, but it is not *quite* no, because there is another source of weight in things besides the earth's pull, and that is the sun's pull. Also, there is the moon's pull, and, indeed, the pull of all the other matter in the world everywhere. These other bodies are, however, comparatively so far away that though things would still have some weight owing to their pull, even if the earth's pull were abolished, yet we should scarcely be able to measure it, and certainly could not feel it with our hands. If all gravitation were abolished, nothing would have any weight.

HOW DOES SOAP MADE FROM FAT GET FAT OUT OF CLOTHES?

If soap were all fat, it certainly could not get fat out of clothes. Indeed, just in so far as there is any fat in soap, it is so much the less useful a cleanser. Therefore, there is never any fat in soap except in soaps which are specially made for use on people's faces. Soap is made from fat, but the fat is decomposed in making the soap. The fat is split up, and a certain part of the fat molecules is combined with the metals sodium and potassium, and that is soap.

Soap melted in water makes a mixture which, especially when it is warm, melts fat out of things and helps to carry it away; but the soaps which are the most effective cleansers contain a large quantity of potash or soda in them. This "free alkali," as it is called, makes the soap a very good cleanser, for it partly decomposes the oils and fats in things, and so helps to dispose of them. There is a great deal of free alkali in soft-soap. There are soaps of other kinds which are good for cleansing such things as metal surfaces, but have quite a different composition, and will not get fat out of clothes—"won't wash clothes."

DO PARROTS KNOW WHAT THEY ARE TALKING ABOUT?

I believe that no parrot knows in the least what it is talking about. The parrot has keen ears and a clever brain, so that it hears very distinctly

words uttered in its presence, and so that it can reproduce with its throat and tongue and beak many of the sounds which it so cleverly hears. Of course, this is a very different thing from an echo, but so far as attaching any meaning to the sounds is concerned, parrot speech is only echo speech.

Small children reproduce words which they do not understand in just the same way, and I am afraid that grown-up people do so, too, sometimes. If we could believe that a parrot understood what it said, we should have to put the parrot on something like our own level in the scale of being. But we find that all words are just the same to a parrot, and it will repeat a word like algebra, shall we say, or hypnotism—if it hears it often enough—just as readily as it will repeat "pretty Polly." It is just a living echo, and no more, and the process that goes on in the parrot's brain is no more and no less than what goes on in our brain when we simply imitate or repeat the sounds of words spoken to us in some foreign language of which we know nothing.

IS IT CRUEL TO BURDEN HORSES?

This entirely depends on the amount of weight that we make the horse carry or draw. There are two ways in which we may be sure that it is not cruel to burden horses within proper limits. One is, that it is pleasant to every living thing to do what it is fitted for, so long as it keeps within the limits of its powers. If someone were to come from another planet, and were to see men playing football or running races, he might say that this must be very cruel, and ask who it was that compelled men to do these things; but the truth is that men enjoy using their muscles, just because they have muscles, and muscles are meant to be used.

People who drive horses know that the horse enjoys the drive as well as the driver, and that makes our second reason. No doubt, a horse would rather run without having to pull something behind it, but as long as it is well cared for and rested, I am sure that the horse is very happy and contented at its work. None of this means, however, that we are right to treat horses as we only too often do. I think that if we were not accustomed to it, and if we really thought about it, we should look upon the spectacle of horses drawing a heavy omnibus as not at all nice; and even that is not nearly so bad as many things which horses have to do. I also think that it is very bad for ourselves to use other living creatures for our purposes unless we are very careful how we do it. So I am glad that we use motor-cars nowadays, for with them we can be quite sure all the time that, however we treat them, we are not causing suffering to a creature that lives and can feel joy and pain.

DOES IRON INCREASE IN WEIGHT WHEN IT RUSTS?

We have to find out what happens when iron rusts, and then we shall have the answer to this question. What happens when iron rusts is, that the outside of it, which is exposed to the air, is burnt, or oxidised. A certain amount of the oxygen of the air is added to the iron, therefore. This oxygen, like everything else, has weight, and its weight must be added to the weight of the iron itself when the iron is rusty. Therefore, the answer to the question must be yes. The iron increases in weight by the weight of the oxygen which it has added to itself. But, as everyone knows, the rust, or *oxide of iron*, is friable, a Latin word which means crumble-able.

The rust will crumble away under the influence of water or wind or anything else rubbing against the iron, and so the iron thing will lose not only the oxygen that it has taken into itself, but also the part of the iron which has combined with the oxygen. So an iron thing, when it rusts, loses weight, and that is very serious, of course, for it means that the thing loses its strength. And if an iron or steel bridge were allowed to crumble away in this fashion, it would soon break. That is one reason why we must keep such a bridge painted to protect the iron from the air.

WHY DO THINGS FADE IF THE SUN SHINES ON THEM?

When such a thing as a curtain or a piece of cloth fades, it is because the chemical substances in it that give it its colour have been partly destroyed. Most of this colouring matter consists of substances which can be burnt, or oxidised, and if a thing is exposed to the air, of course there is plenty of oxygen round about it. The sun's rays destroy the colour, because they help on this

chemical change that we call oxidation. Every photograph is taken because of the power of the sun's rays to produce chemical changes, and the fading of a piece of cloth exposed to the sun is really very much the same as what happens in a photographic plate. The part of the sun's rays which has this chemical power is the part which produces the colours of blue and violet when it strikes our eyes, and also two or three colour-notes, as we might call them, higher up than the violet, which our eyes cannot see, and which are called ultra-violet.

WHY DOES MY FACE TURN WHITE WHEN I AM FRIGHTENED?

Here is another question about the fading of colour, but it is very different from the last. The skin of our faces has a certain amount of colour of its own, but the main part of the colour of the face—at any rate, in this part of the world—is the colour of the blood shining through the skin. When I say shining, I do not mean that the blood gives out any light of its own, but that it throws back to our eyes the red part of the light that falls upon it through the skin. It is the heart that, as it beats, drives the blood through the skin of the face. When a person is frightened, the nerves running from his brain to his heart almost stop the heart from beating. So scarcely any blood whatever is sent through the skin of the face, and we see the pale colour of almost bloodless skin.

Anything that interferes with the heart's beating will have the same result as fright: bad air, for instance, causing anyone to faint. When a person's face becomes extremely pale, we should understand that there is a risk of his fainting, for if not enough blood is passing through his face, it is probable that not enough blood is passing through his brain. In some people, whose hearts are not well, it is difficult to supply the head with enough blood. These people are usually pale, and are liable to faint.

WHY DOES CHLOROFORM SEND US TO SLEEP?

All our consciousness depends upon work done by the brain. When we think, our brain is at work; or when we see, or when we feel pain. A person who has breathed a sufficient quantity of chloroform or ether, or who has had a large enough dose of opium or alcohol, cannot feel pain even when the skin is cut, because pain is really felt in the brain, and the brain of such a person is prevented from working.

The question, then, is: How do anæsthetics, as these things are called, stop the working of the brain? We do not know much about it yet, but we know that such an anæsthetic as chloroform is made up of certain chemical molecules; we can prove that when chloroform is breathed these molecules pass into the blood as it circulates through the lungs, and so are carried by it, in only a few seconds, to the brain. We know, too, that chloroform is a very volatile thing, and that it readily passes through the walls of the blood-vessels in the brain into the substance of the brain itself. There the chloroform molecules combine with the molecules of the brain, probably with the result that the brain can no longer use up the oxygen in the blood, and so has to stop working. But as soon as the person stops breathing chloroform, and the blood going to the brain becomes free of it, the chloroform passes back from his brain into the blood, is breathed away by the lungs, going back just by the way it came, and the person becomes conscious again.

WHY HAVE HORSES HAIR AND SHEEP WOOL, WHEN BOTH EAT GRASS?

It is one of the most wonderful facts about living creatures that they can turn into the substance of their own bodies almost any kind of food. As long as what they eat contains certain classes of chemical substances, they can use it as sources of the life of their bodies, and the life of their bodies produces the particular things that suit them.

Hair and wool are not really very different; wool is, indeed, only a kind of hair, and some races of men have quite woolly hair. But you might take certain kinds of food material, such as white of egg, and give it to any kind of animal, and it would be turned by each animal into a different thing—a bird would turn it into feathers, a sheep into wool, a fish into scales, a lobster into its shell, and a porcupine into quills. All this shows us how completely the life that is in every creature transforms its food, and can make, out of almost any food materials, the particular kind of thing that it is fitted to make. But no kind of food that you can choose or

imagine will make the horse grow scales or the fish grow hair or the lobster grow feathers. The particular kind of life in each creature can do what it is suited to do, but can do nothing else.

WHY DOES THE ELECTRIC BELL RING WHEN WE PRESS THE KNOB?

We can almost answer this question for ourselves if we have in the house one of those electric bells that one r ngs by pressing the knob of a little round wooden box at the end of a wire. If we unscrew the top of this little box, we find little pieces of metal inside it, and we see that, when nothing is touching them, they do not touch each other; but if they are pressed upon they do touch each other, and then the bell rings. When we press the knob—though we see nothing—what we do is s mply to press these two pieces of metal against each other, and as long as they touch each other the bell will ring. When we stop pressing the knob, the *contact*, as we say, between the two pieces of metal is broken, and the bell therefore stops ringing.

These pieces of metal are connected with wires that run from an electric battery. When they touch each other, the electricity from the battery can run round the wire. As we think of the electricity running round, we call this arrangement an electric circuit. In the course of this circuit, or circle, there is a bell, so arranged that whenever the electricity passes along t, the bell is disturbed and rings. When we press the knob we complete the circuit; when we let go we break the circuit, and then the electricity can no longer run round.

WHY CANNOT A BIRD FLY IF LET FALL FROM A BALLOON THREE MILES HIGH?

This is a very cruel experiment to make, and I do not see how anyone who had not a heart as hard as adamant could defend it; but the result of it is very interesting. As we go high in a balloon, the air becomes less and less dense, and breathing more and more difficult. The pressure of the air outside is not high enough to force enough air into our lungs, and so the balloonists suffer a great deal. If they take up a bird with them, it must suffer in just the same way. So, one reason why such a bird, when let drop, cannot fly would be that its brain was affected by lack of air in its blood; but even if this were not so, the bird could not fly, because the air at such a height is too thin, or *rare*, as we usually say, to support it.

A man's body is heavier than water, yet the difference is not so great but that by making certain movements he can prevent himself from sinking. If something could be done to the water so that it became thinner and lighter, the time would come when he would sink, whatever efforts he made. The ocean of air is so thin that no man is strong enough to swim in it. This is true even of the air near the ground. But some miles up, the ocean of air has become so th n that even a bird, with its tremendous strength in proportion to its weight, is not strong enough to support itself, and so it must drop.

IS THERE A FIRE IN THE MIDDLE OF THE MOON?

When we speak of the fire in the centre of the earth, we do not mean anything that is burning in the sense that a fire is burning, but something that is very hot, and so would glow if we could see it. In the case of the earth we live on, we can dig downwards and find how hot it gets as we go down, and we can study the hot things that come up from volcanoes. But it is very difficult to find out how hot even the surface of the moon is, and we cannot dig into it. We can only guess what the inside of the moon is like, then, and we can do this in various ways.

There is no doubt that the inside of the moon was once very hot, for the moon is scarred with tremendous volcanoes which prove it. These volcanoes now, however, do nothing. The inside of the moon, therefore, is certainly noth ng like as hot as it once was. Further, the very size of these volcanoes teaches us that the process of losing its heat in the case of the moon has been a very rapid and violent one. Now, we know the s ze of the earth, and can learn something of the rate at wh ch it loses its heat. Also, we know that this loss is very much retarded by the great blanket which we call the atmosphere. The moon must be made of very much the same materials as the earth, and when it was formed must have been as hot as the earth; but it has not an atmosphere to keep in its heat, and it is so very much smaller than the earth that it would be bound

to cool very much more quickly, just as the earth, which is so much smaller than the sun, has cooled more quickly than the sun. Therefore, it is certa n that the middle of the moon can be nothing like as hot as the middle of the earth, and probably it is not what we would call hot at ali.

WHERE DOES OIL COME FROM?

If we look at the world around us today and observe where oil is being made, we find that it is made in the bod.es of living things, and there only. The bodies of animals and human beings make it. You and I are, or ought to be, nicely clothed with a warm layer of fat, or oil, under our skins. The bodies of such animals as the fish make it, as in the case of cod-liver oil; the bodies of plants make it, as in the case of castor oil or olive or salad oil. Oils of these kinds, however, are scarcely at all used for burning; and the enormous quantities of oil that are every day burnt in the world are what is called mineral oil.

The word petroleum, for which petrol is short, means rock oil. Peter, as the Bible tells us, means rock. This mineral, or rock, oil is found in various parts of the world; and just in those same parts of the world there is found natural gas that can also be used for burning. It has quite lately been learnt that we are wrong in supposing *mineral* oil and gas to be the products of minerals and rocks. When we examine such a thing as petrol chemically, we find that it has the composition of a thing that has been made by a living creature. We now believe that all oil, even including petrol and such things, has been made by life.

Just as coal is the product of past vegetable life, so, also, all these oils which we now use for the same purposes as coal are the products of past vegetable life upon the earth, and they have been gradually formed from the bodies of these dead plants by the process called distillation, under the immense pressure of the earth lying above them.

WHY DOES A DIAMOND CUT GLASS?

When one thing cuts another, it is because the thing that cuts is harder than the thing that is cut. The steel of a knife is harder than paper, and so it will cut paper. Anything will scratch or mark anything else which is less hard.

So we can take a number of different things and can arrange them in order. A list of ten things has been made in this way; and so we can say that glass, for instance, has the hardness of six, which means that it will scratch anything that has a hardness of one, two, three, four, or five, but will be scratched by anything having a hardness of seven, eight, nine, or ten.

Most glass and a knife are much of the same hardness. Pure rock crystal or quartz will scratch a knife and will scratch ordinary glass. The precious stone called a sapphire is harder than any of these, and ranks nine on the scale of hardness. Emery paper is coated with an impure sort of sapphire substance. Number ten in the scale of hardness is the diamond, which will cut any other thing whatever, including glass or a knife or a sapphire. The Greek word adamant means unconquerable. When we want to say that a thing or a person is as hard as can be, we say "as hard as adamant."

WHY HAVE WE DIFFERENT TASTES IN EATING?

We know that no two people look quite the same. Everyone's face is differently made from every other face. We know that when we take prints of the markings on people's fingers they always d ffer from one another. We have never yet found two finger-prints in different people that were quite the same. And just as people d ffer in their faces and in their skins, so they differ in deeper things. No two bra ns are quite the same, and so no two people have quite the same tastes.

But there are other special reasons why people have different tastes in eating. Different people's bodies have different needs. One person's body may require a good deal of fat, and may be very capable of digesting fat, and so that person will like fat and oily things—which may be less good for another person, and which that other person likes less. Then, again, at different ages we have different food requirements. Children are very active, and since they are small, lose their heat quickly. They therefore require a large proportion of food to supply them with energy and heat. Perhaps the best of such foods is sugar, and that is the good reason why children and young people like sweets

and sweet things more than most grown-up people do. This is not greed, but the demand of the body for what it specially needs. Thus tastes differ, too, in different parts of the world. Eskimos live in cold countries, and eat blubber and other forms of fat to keep them warm; but in hot countries people are much less fond of fatty foods.

WHY DO WE LEARN LATIN WHEN NO COUNTRY TALKS IT?

Not so many hundreds of years ago Latin was the universal language of all scholars. In those days, anyone who had a book to write wrote in Latin. So Newton in England, and Galileo in Italy, and Copernicus in Denmark, for instance, all wrote the same language. Anyone who meant to be a scholar, then, of course had to learn Latin. Things have utterly changed now, but children are still taught Latin, and the real reason is, that children used to be taught Latin, and therefore children are taught it to-day. The reason commonly given is that we must learn Latin in order to enjoy the great authors who wrote in Latin. If that were the real reason, then the teaching of Latin would be a terrible failure, as not one boy or girl in ten thousand ever gets to that point. Also, nowadays all the great writers of antiquity have been well translated into every modern language by great scholars who spent their whole lives in finding out the exact meaning of what those authors wrote.

Yet there is still a very good reason why everyone who has plenty of time for his education should learn a little Latin. This is that it helps us to understand and appreciate the value of English. For instance, take that last sentence. Everyone who has learnt Latin knows that appreciate means "put a price to," and that the word value comes from a Latin word meaning *to be strong*, as when we say a valiant man, or that a person or a thing is invalid—not strong. If a boy has learnt Latin for a few years at school, it thus helps him to use and enjoy his own language—which is half Latin.

WHY HAS OUR LANGUAGE SO MANY WORDS TAKEN FROM OTHER LANGUAGES?

Our language would be a very poor thing if it had not the advantage of helping itself to all the words it wants from other languages. Men had been reading and writing and thinking for many ages when our ancestors were savages. The various races who invaded Great Britain long ago brought with them their languages, and all the scholars who have read Greek and Latin have introduced words from those languages, such as the word "introduce," which means "lead within." English is the most mixed language in the world, and that is exactly the reason why it is the best, having more variety, more power of expression, more power of being turned equally well to purposes of beauty, to purposes of dignity, or to purposes of exactness, than any other language there is. Most of our commonest words are Anglo-Saxon in origin, a great many are Norman-French; a few are Keltic, many are German, and many more—the number of which is daily increasing—are Latin and Greek.

WHY HAVE WE DIFFERENT WORDS FOR THE SAME THING?

Language would be apt to be rather dull if we had only one word for everything. For instance, we should have to repeat it so often that it would become tiresome. Then, again, if we have different words for the same thing, we can use them, if we are clever, so as really to mean different varieties of the same thing. A poor language will have only one word where a very rich, full language, like our own, will have such words as joy, delight, pleasure, happiness, bliss, rapture, ecstasy—which all mean practically the same, and yet do not mean quite the same thing. We should use them to express different shades of meaning, and so we could say of somebody who became happier and happier that joy became bliss, and bliss became ecstasy.

Apart from this, there are many cases where we have two or more words for the same thing simply because they have come from different languages. For instance, commencement is sometimes used instead of beginning; the former comes from Latin, the latter is the good old Anglo-Saxon word, and we should always use it in preference to the other. Then, also, we have words which are really the same, only that one of them has come to us from Latin through the French; while the other is a word which came into English directly from the Latin at

the time of the revival of learning. Such words are called doublets, like loyal and legal, royal and regal, sure and secure, and many more.

IS THE COLD OF WINTER DUE TO THE SUN'S GREATER DISTANCE FROM THE EARTH?

The earth is *not* farthest from the sun in winter; it is then nearest to the sun. But the distance of the earth from the sun has really nothing to do with the weather in any way, and we should get this clearly into our minds. The fact that the earth does not move in a circle round the sun, but in an ellipse as we know, so that its distance from the sun varies, is enormously important, because the law of gravitation would not be true if the earth moved in a circle. Indeed, Newton measured and discovered gravitation partly by knowing how the earth moves round the sun. But the path of the earth, though not a circle, is very nearly a circle; and the difference in its distance from the sun at different times is far too small to affect the weather. It may be that, long ages ago, the earth's path was much more elliptical than it is now, and then the difference in its distance from the sun may have been very important for the weather—but not now.

WHY DOES IT RAIN MORE IN WINTER THAN IN SUMMER?

The last question was wrong in what it suggested about the earth's distance from the sun, but it pointed out a very interesting fact all the same. For the sun's heat is much less in winter than in summer, even though the earth is rather nearer to the sun; and the reason for this is, that owing to the slight tilting of the earth, the rays of the sun do not come straight in winter, but slant, and so lose more heat on the way. So the question now is why there should be more rain when there is less sun to make rain. But, if we consider, we shall see that this reduction of the sun's heat in winter "works both ways." If there is less sun to draw up the rain, there is less sun to hold the rain or moisture in the air. Thus it might be that during the summer the warm sun drew up much moisture into the air, and that during the winter, when the air is cooler and can hold much less moisture, the rain came back again. There is probably a good deal of truth in this, but it is far from being the whole truth. There are wet days in summer, and there are often beautifully clear and dry days in winter. These facts are sufficient to show that the heat of the sun in various parts of the year is *only one* of the factors of the weather, as we say; *factors* is Latin for *makers*. At bottom the problem of the weather is really one of the atmospheric electricity, and we cannot answer all these interesting and important questions about the weather fully until we learn very much more about that.

HOW IS IT THAT WE LOSE THE SENSE OF SMELL WHEN WE HAVE A COLD?

The sense of smell depends upon scented things coming in the air to the lining of our noses, especially certain small parts of the lining of the nose. When we have a cold, this lining, or mucous membrane, of the nose gets swollen, and produces a much greater amount of mucus than usual, as we all can tell by the number of handkerchiefs we have to use in a day. The chief reason why we cannot smell so well when we have a cold is, I think, that this mucus, constantly pouring out of the lining of the nose and running over it, prevents the scent of things getting to the sensitive part of the nose, and washes away any solid scented particles that there may be in the air. Also, it may very likely be that the poisons produced by the microbes that cause a cold, poison the living cells of the mucous membrane, and also poison the tiny ends of the nerves of smell that run to it, so that even if scented things do reach the sensitive part of the mucous membrane, they cannot be felt.

This applies alike to scents coming in from outside and also to the scents of food, which pass up at the back of the roof of the mouth into the nose, and which, when we have not a cold, help to give our food half its flavour.

IS EVERYTHING A PART OF NATURE?

Certainly everything is a part of Nature. All truly great men, ever since men began to think, have known this. An English poet has said that all things are

> Parts of one stupendous whole
> Whose body Nature is and God the soul.

That was said by Pope. A later poet, Wordsworth, has written these lines, amongst the greatest in all

our great poetry. He says that he sees in Nature something

Whose dwelling is the light of setting suns,
And the round ocean, and the living air,
And the blue sky, and in the mind of man:
A motion and a spirit that impels
All thinking things, all objects of all thought,
And rolls through all things.

Thousands of years before even Pope or Wordsworth, the great Indian thinkers saw the same truth, and said, "the real is one." Man, therefore, as Wordsworth said, his body and his mind, are parts of Nature. The laws of Nature and the laws of life apply to him, and the more we learn the surer we are that we are right when we call the whole of Nature the universe—a thing that turns and moves as one because it is a whole of which everything that exists is a part.

WHY CANNOT TWO PEOPLE DECIDE WAR AND SO SAVE MANY LIVES?

It is only the bad passions of men which prevent this from being possible. If two good and honest men, or two good and honest countries, have a difference of opinion about something, they will meet and talk it over, and will try to find out which is the right thing to do. If they cannot agree they will appoint some other person or country that they both trust to decide what is the right thing, and they will undertake to stand by what he decides. The person who does this in a game of baseball is called the umpire. The Latin word for an umpire is *arbiter*. So, when nations, or single persons, or employers and workmen use this method of settling their differences, it is called *arbitration*. It is, of course, in every way the best plan for settling differences.

But all nations are not good and honest, and if a nation wants something which it has no right to have, and knows that no arbitrator would award that thing to it, then it invents some false excuse, usually about its honour, and proceeds to dishonour itself by making war. This injures not only the nation it makes war upon, but itself and all other civilised nations. Gradually, as people come to see this, they will make those who govern the nations undertake to refer most disputes to arbitration. This change from war to arbitration is slowly but steadily going on, and will certainly continue until wars become less frequent. That will happen directly the ordinary people of all countries have sense to understand what harm war may do to them.

WHY DOES YEAST MAKE BREAD RISE AND BUBBLE?

The bread, or, rather, the dough, contains a certain amount of sugar, which has been made in it from the starch made by the wheat plant. Yeast consists of an enormous number of tiny living plants, which produce inside their bodies a ferment—a chemical substance which we have just learned how to separate from the yeast cells themselves; and this ferment has the power of working on the sugar in the dough so that it is broken up and changed into other things. These things into which the sugar is changed are two, alcohol and carbonic acid gas. We lose all the alcohol thus made, for it passes away into the air. The total amount of alcohol we thus lose in a year is enormous, and this is a pity, since we might use it for many purposes, especially for burning in lamps and motor-cars, and so on.

The carbonic acid, as it is formed, makes little bubbles in the dough, and as these get bigger and more numerous, they raise the dough and turn it into bread. We can make bread in another way by forcing carbonic acid into the dough from outside. This is perhaps rather a good way, for it saves the sugar in the bread, and that is a food.

WHAT CAUSES THE SPOTS ON THE SUN?

Though men have been watching sun-spots steadily for 300 years, and though we know a great deal about them, th s question is a most difficult one to answer. We are not really quite sure at what depth in the surface of the sun sun-spots lie. They are certainly not quite on the surface of the sun, and they are dark because, as we can prove, less light and less heat come out from a sun-spot than from other parts of the sun. If we think of the whole of the sun's surface as a gas—as a glowing atmosphere indeed—we shall expect to understand it better when we know more about what happens in our own atmosphere.

We know that all sorts of twisting, twirling movements go on in the air, some of them being very large and travelling across it as they twirl; and the new experience of the air which

people are gaining by flying through it in flying machines has taught us that these kinds of movements are to be found everywhere. But the sun's atmosphere is part of a globe which entirely consists of gas, and is intensely hot. So we may expect to find far more movement in it than in our own, and sun-spots must be caused by things which are going on much deeper down in the surface of the sun; and so, as the sun spins, the sun-spots we see spin with it, as we can see if we look at the three pictures on page 2081.

IS THE WHITE OF AN EGG PART OF THE CHICKEN, OR WHAT THE CHICKEN FEEDS ON?

The white of the egg, and very nearly the whole of the yolk, too, are not part of the chicken, but what it feeds on. If we look at an egg that has just begun to develop, we can see just at one point on the surface of the yolk the little thing that will be the chicken; and a day or two later we can see tiny little blood-vessels spreading out from this point over the yolk, so as to help themselves to the food in the yolk. Afterwards the white of the egg is also eaten up by the chicken. The white of an egg consists of albumen and water. Albumen means the *white* thing.

This egg albumen is not the same as the albumen which is in our blood and on which our bodies feed, but it is really very similar. When it is eaten up by the developing chicken, or when we eat the egg, young chicken and all, this egg albumen is changed by digestion into the blood albumen of the chicken or of ourselves, as the case may be. As nearly all the egg is nourishment for the young creature that is to develop, different kinds of eggs vary very much in size quite apart from the size of the creature that is to develop from them. Some creatures are born from eggs which contain no nourishment, as the nourishment is supplied in other ways, and such eggs may be so small that they can only be seen through the microscope.

HOW IS IT THAT FISHES ARE NOT SALT WHEN CAUGHT?

The part of the fish that we judge by is its muscles, which form its flesh, and which we eat. Though the fish swallows salt water, it only takes into its blood what it requires for the purpose of its life.

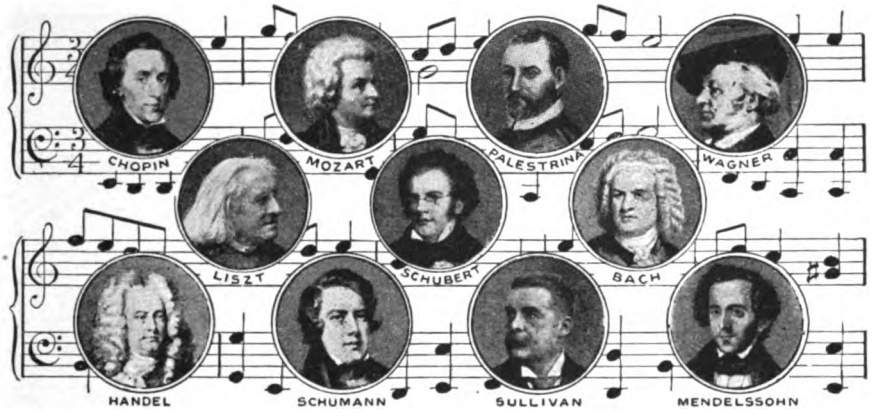
If we look at it in this way, we shall understand how it is that the saltness of a fish's muscles is not very different from that of a chicken's muscles. When we study the whole animal world, we find that the proportions of salt required in the water or in the blood that we find in the bodies of many different creatures are very much the same. The cells that make up muscles are very much the same in their way of living and their needs, whether we find them in a bird, a fish, an ox, or ourselves. Thus we should not expect to find the flesh of the fish salter than that of another creature nor to find that it makes any particular difference whether the fish is a salt-water fish or a fresh-water fish. We must remember that the fish, like ourselves, has the power of choosing from the things which it swallows just those things which it needs for its life, and of taking them, and them only, into its blood.

WHY HAVE FACTORIES TALL CHIMNEYS?

We know only too well that the business of the chimneys is to carry the smoke from the furnaces into the air. It may be that if the chimneys are tall, it makes a better draught for the furnaces, but that is not the important thing. The point is that, according to our present way of burning coal, a large amount of the coal is wasted, and simply blown up the chimney without being burnt in the form of smoke. In the air this injures everybody and everything—men, animals, plants, pictures, houses, and all. But the higher it is sent into the air, the better is its chance of being blown away and thinned out before it settles. Evidently it would not do to have a chimney discharging factory smoke at the level of somebody's bedroom window, for instance.

But I fear that tall chimneys will be wanted—ugly though they are—even when we burn all our fuel in factories in a proper way, and discharge into the air only the gaseous products of its complete burning. Even in the most perfect kind of burning there must always be carbonic acid gas produced, since the chief element in fuel is carbon, and since carbonic acid gas is completely burnt carbon. This gas, which we produce ourselves as we burn, is a poison to us if there is too much of it in the air, and so it must be sent into the air as far away from our mouths as possible.

The next Questions are on page 3377.



GREAT COMPOSERS OF MUSIC

CONTINUED FROM 3088

It is rather curious that while the earliest times produced great writers of prose and verse, there were no really great composers of music until within the last three or four hundred years. The first composer treated seriously by the musical historians was Palestrina, who died in 1594. He wrote a Mass—that is, a musical setting of the Roman Catholic Church service—which the Pope thought so fine that he ordered it to be taken as the pattern for all the future music of the Church. But Palestrina's music never took hold of the people. The first great composer whose music did that was George Frederick Handel.

Handel was a German, born at a little town called Halle, in 1685. His father was one of those seventeenth-century barbers who were at the same time doctors and dentists. And he had made up his mind that his son should be brought up in the profession of the law. But music was in George's blood, and nothing would check his ambition to be a composer. He smuggled a rickety spinet—an old-fashioned kind of piano—up to the attic where he slept, and at night, when all the others were in bed, he played and played, until he mastered the instrument. His father soon realised that it was no use keeping him back from his desire, so he procured him good teachers, and did everything that he possibly could to help him forward in his chosen art.

Well, in time Handel began to compose big works, mostly operas. But the operas had no great run on the Continent, so he came to London and settled down there. For long years he did almost nothing but write operas, and he generally rented a theatre of his own. He had some successes, but he had more failures; and, in fact, was twice bankrupt over his opera business. Yet, if Handel had not failed with his operas, we should never have had those grand oratorios by which we know him now. For he turned to oratorio when he had exhausted himself with opera. An oratorio is a long sacred composition for voices, the words nearly always taken from the Bible.

Somebody has said of Handel that he set the Bible to music. And he very nearly did. He wrote more than twenty oratorios, though not more than three or four of them are performed to-day. But one alone, of the three or four, would have been quite enough to immortalise the name of Handel; for it is to Handel that we owe "The

Messiah," heard all over the country every Christmas season. Just as we think of "Paradise Lost" when we think of Milton, or of "Robinson Crusoe" when we think of Defoe, so it is "The Messiah" that comes to our minds when we think of Handel. And he wrote it—this long work, which takes more than two hours to sing—wrote it, choruses, solos, accompaniments, and everything, in twenty-three days!

A GREAT GERMAN COMPOSER WHO IS BURIED IN WESTMINSTER ABBEY

Of course, he wrote other things that we like to remember besides his oratorios. Every young pianist plays his "Harmonious Blacksmith," for instance, and violinists and singers often have his name in their programmes. Sometimes, too, if we go to an organ recital, we shall hear a concerto of his. But, after all, he is *the* great composer of oratorio, with only Mendelssohn as a faint rival. The English are so proud of him that they like to claim him as English from his long residence in London. He was, indeed, a naturalised Englishman, and when he died, in 1759, they laid him beside their great men and women in Westminster Abbey, where we may see a monument representing him in the act of writing "I know that my Redeemer liveth" for "The Messiah." We may also see his house in Brook Street, Hanover Square. He had a fiery temper, used "bad words" sometimes, and once threatened to throw a disobedient singer out of the window. But he was pious and charitable too, and we like to know that he gave an organ, and much of the money he drew from his oratorios, to the Foundling Hospital. They have a new organ there now, but some of the original pipes of Handel's organ are built into it.

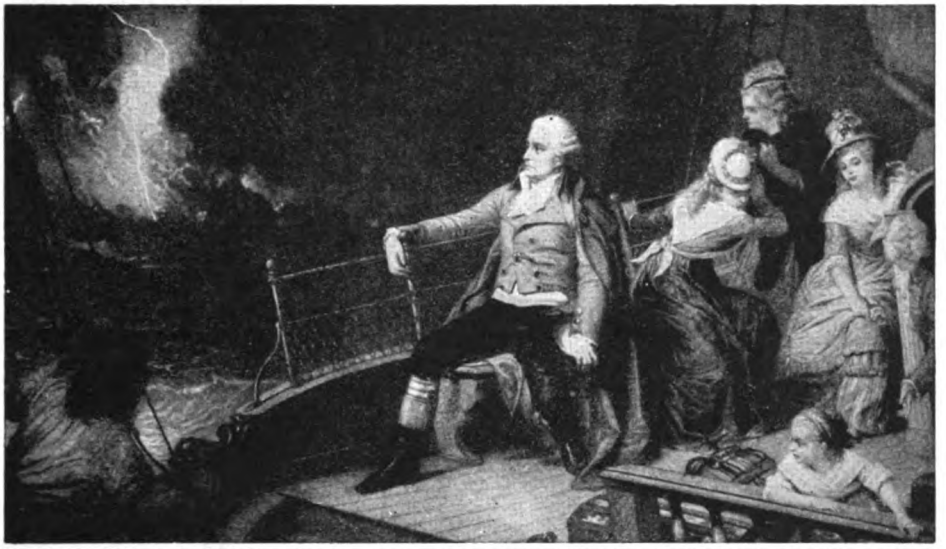
HANDEL AND BACH, WHOSE MAGNIFICENT MUSIC WILL LIVE FOR EVER

The greatest musician who was living in Handel's time was John Sebastian Bach. The two, Handel and Bach, are often spoken of as if they were a sort of Siamese twins of music. They were both Germans, and they were born within a month of each other. Both, again, were fine organists; both gave great religious works to the musical world; and both were stricken blind in their later years. Beyond that, they did not have much in common. Handel never married; Bach was a quiet, stay-at-home man, who married twice and had a family of twenty sons and daughters. He was an organist first of all, and his organ compositions, after all these years, are the most perfect things of the kind ever produced; and there is not a serious-minded organist in the land who does not think of Bach when he is going to give an organ recital. Bach is to the organist what Shakespeare is to the actor.

In this connection there is a little story that may be told. Bach lived in the time of Frederick the Great. Now, Frederick was musical; he played the flute very well, and he took a notion to have a visit from Bach. So Bach, then an old man over sixty, set out on the journey. The king was at supper when his arrival was announced. Springing from the table, Frederick broke up the meal with the words, "Gentlemen, Bach is here!" and took Bach, weary as he was with travel, through the palace. Bach played upon the piano, and improvised upon a little melody given him by Frederick. Then, at the end, he told Frederick that he *preferred the organ*.

THE GRAND OLD MAN OF THE ORGAN, WHOSE INFLUENCE LIVES TO-DAY.

That was what Bach preferred; and we think of him mainly as the grand old man of that noble instrument, which we are constantly hearing in the churches, and musicians call the "king of instruments." It is not likely that we shall often hear Bach *outside* the churches. But let us remember this: that Bach has had a great and lasting influence on all the great composers who have followed him. All looked up to him, and took, as it were, their cue from his seriousness and his calm dignity. Beethoven was enthralled by his B minor Mass, which is occasionally performed. Mozart, by chance, listened to some of his compositions, and came away deeply impressed and wondering. Mendelssohn, Schumann, Wagner, Brahms—every one of them revered Bach as their godfather in music. So, while we may not hear very much of Bach's own music, we should never forget that we are as good as hearing it in the works of those who came after him. This wonderful genius died in 1750, nine years before Handel, who



Like most of the great composers, Haydn was very poor in his young days, and wandered about the streets of Vienna playing the violin to make a very precarious living. But later he became rich and famous, and it was in England that his greatness was first recognised. Here we see him on his way to this country watching and listening to a storm to which he afterwards gave realistic expression in his oratorios the "Creation" and the "Seasons."

Handel has been called the sublimest musical genius upon record. His father wanted him to be a lawyer, and removed all musical instruments from his house, but Handel, although only six years old, managed to get a clavichord—a small piano—conveyed to the top of the house, and upon this he practised secretly at night after the rest of the family had gone to rest. But at last he was discovered, and here the artist shows us the scene.

mourned for him as for a brother. So much for the first pair of great composers. Now we will take another pair—Mozart and Haydn. It has been remarked as strange that Bach and Handel, though they were born, both Germans, in the same year, and lived practically throughout the same period, never met. It was not so with Mozart and Haydn. They met often, and they were very fond of each other. It was Haydn who described Mozart as "the most extraordinary, original, and comprehensive musical genius ever known in this or any other nation."

That was a very generous tribute, especially as musicians are so often extremely jealous of each other. We will deal with Haydn first, for he was called "Papa" Haydn, so much did they love him in his own day. And we, too, for other reasons, may well call him "Papa." He was the father of most of the instrumental forms of music which are now regarded as *fixed* forms—the symphony, the sonata, the string quartette, and the like. That is to say, he wrote works in these departments which every composer feels to be the right models to follow.

THE POOR PEASANT BOY WHO BECAME THE FATHER OF MODERN MUSIC

That, in itself, was a notable thing to achieve. And it was particularly notable for a poor boy who had to go out into the world to earn his own living at an age when boys nowadays are at school, enjoying their games, if not their lessons. The parents of this great composer were humble Austrian peasants, and they were living in a wretched farmhouse of one storey, with a barn attached, when he was born, in 1732.

But Haydn had, at any rate, one advantage: his musical abilities, discovered in early childhood, were not thwarted by his father. The father arranged for the training of his young prodigy, and the young prodigy was taught his crotchets and quavers with many floggings when things went wrong. He developed a good voice, and so was sent to sing in the choir of Vienna Cathedral. But the day came when his voice "broke," and he was of no more use to the choirmaster, who might have kept him resting until his voice "set"; but Haydn had displeased him. One day he played a boyish prank on a fellow-singer by cutting off his pigtail, and now he was dismissed from the choir and left to provide for himself as best he could.

You would not like to hear of all the hardships he endured for long after this. He became a great singing teacher's servant; he played the violin at dances and even in the streets!

THE HAPPY DAYS OF HAYDN'S LIFE AND HOW HE WROTE HIS BEST MUSIC

But he was perfecting himself in composition all the time; and a set of sonatas that he wrote took the fancy of a wealthy countess, who procured him a remunerative engagement, and introduced him to pupils who paid well. Henceforward he had no trouble in getting on. In 1760 he married, not very happily, and a year later he entered the service of the Esterhazys, one of the richest Austrian families of the time. Great families kept a permanent band of their own in those days, and Haydn was the Esterhazys' bandmaster. The post gave him a good salary and a comfortable home, and he went on with his composition under the most favourable conditions.

That was until 1790, when the Esterhazy orchestra was disbanded. Then he went to London on a visit, and wrote for certain London concerts some of those symphonies which we still delight to hear. Altogether he wrote about 150 of these symphonies. Mozart saw him just before he left, and wept at the parting. "We shall never meet again," he said; and it proved true. In the music of some Church hymnals we find a tune called "Austria," with Haydn's name attached. It is almost as well known as "God Save the King"; and it was after hearing "God Save the King" in London that Haydn felt he must make a national tune of the same kind for his own beloved Austria.

THE TENDER HOMAGE OF ONE GREAT MUSICIAN FOR ANOTHER

He went home and wrote "God Preserve the Emperor," and then somebody made the air into the hymn-tune that we have sung so often.

And what else of Haydn's do we know? A good deal, I am sure. His symphonies are still played by our leading orchestras; his piano music is in all the publishers' lists; and his

GREAT COMPOSERS AT THEIR INSTRUMENTS

Mozart, seen here with his father and sister, was one of the most remarkable musical geniuses that ever lived. When only five he composed beautiful music, and at seven could play the most difficult works without a mistake.

The world has never produced another master of the organ like Bach. When he played, as shown here, his listeners almost heard the instrument speak. We owe our system of piano playing with all the fingers to Bach.

Mozart's later years were very sad. He had made very little money and had spent it all, and was constantly in debt. His health, too, was bad, and jealous enemies persecuted him bitterly. At last these things brought on an illness, from which it was evident he could never recover, and summoning a few friends to his bedside, he asked them to play over the magnificent "Requiem" he had recently composed. This they did, as shewn here.

The bottom picture on this page is reproduced from the painting by Kaulbach, by permission of the Berlin Photographic Company.

oratorio of "The Creation" ranks as a good third to "The Messiah" and "Elijah," of which latter we shall speak presently. Haydn wrote "The Creation" in his old age, and it was in listening to a performance of it that he made his last appearance in public. The excitement was too much for him. "Not I, but a Power from above created that," he cried out at one point. They carried him away, and as he passed, Beethoven, who happened to be there, bent down and fervently kissed his hand and forehead. It was a pretty and a tender act of homage.

Haydn's music is for the most part bright and genial, and even sparkling, with a dainty grace, and a constant melody, which was his most marked characteristic. Very superior persons will tell you that he toadied to princes and dukes and other important people, and wrote music merely for the moment. It is not true. Young people, at any rate, must always love Haydn and his music, for young people do not want to be made miserable when they play the piano or listen to the band. And Haydn will never make them miserable.

THE WONDER OF MOZART'S GENIUS AND HOW HE COMPOSED MUSIC AT FIVE

Neither will Mozart. Young people should take a special interest in Mozart, for Mozart was a distinguished musician at a more tender age than any of the other great composers. A young man once asked Mozart to tell him how to compose. The gentle Wolfgang Amadeus, for these were his Christian names, made answer that the questioner was too young to be thinking of such a serious occupation. "But you were much younger when you began," said the aspirant. "Ah, yes, that is true," replied Mozart, with a smile; "but then, you see, I did not ask anybody how to compose." No! Mozart was born in the city of Salzburg, in 1756, and he was only five when he composed a minuet and trio that boys and girls of much maturer age might play with some effect to-day.

His father was a good musician, specially expert as a violinist, and Wolfgang had a sister, Maria Anna, who, at first, showed nearly as much talent as himself. Hence they all—the father and the two children—started on a musical tour, in the course of which Mozart played before the Empress Maria Theresa, and romped with the little princess who afterwards became Queen of France—the unfortunate Marie Antoinette. These great ladies used to take him on their knee, and kiss him, and shower gold upon him. All the royalties, in England, made a darling of him and petted him greatly.

HOW MOZART BECAME POOR AND DANCED TO KEEP WARM

It was Mozart's happiest time, for, from the day that he began life in earnest as a married man—that was in 1782—the wolf of poverty was never away from his door. He composed incessantly, but even successful composition did not pay then as it does now, and the butcher and the baker were often worrying poor Mozart for a settlement of their accounts. A friend called one winter day, and found Mozart and his wife waltzing round the room. "We were cold," they said, "and we have no wood to make a fire." Let us think of that, and then think of the glorious works that Mozart produced under such depressing conditions. He left 769 compositions in all, and he was still under forty when he died.

In his own day he was regarded chiefly as a composer of opera, and we still think very highly of his "Don Giovanni," and "The Magic Flute," and "The Marriage of Figaro," though we seldom have a chance of hearing them. He wrote forty-nine symphonies, and conductors still like to have some of these played, particularly the so-called "Jupiter" symphony, and one in G minor, which has been described as his "tenderest and daintiest instrumental composition." All his works are full of charming melody, of which he had a fund only equalled by Haydn.

THE STORMY DAY WHEN MOZART WAS LAID IN AN UNKNOWN GRAVE

Mozart's end was very sad. He was taken ill in 1791, and during his illness he wrote a famous "Requiem," a sort of funeral song, which he had sung around his death-bed, to hear its effect. Then, on his funeral day, a great storm arose, and only the undertaker and his men went to the cemetery to see him buried. He died so poor that his remains had to be put into a pauper's grave, where many other coffins lay. Nobody looked near the grave for many years,

and then it was found that nobody could point it out. So Mozart's monument in that great Vienna cemetery stands over an empty grave, while the composer's dust reposes no one knows where. It is pathetic to think of such an end of a great man.

There was another great composer who went through very much the same sufferings, the same persecutions and fate as Mozart. His name was Franz Schubert. "My music is the product of my genius and my misery," Schubert said. It could hardly be otherwise. His people were poor, and he had eighteen brothers and sisters, from which we may judge that no special attention was given to his education and upbringing. But, just as "truth will out," so will genius. Schubert entered upon music as a prince enters on his dominions. When they began to teach him music, they found that somehow he had learnt the rudiments for himself.

He began to compose at eleven, and he consumed as much music-paper as would have made a small fortune for a stationer. He wrote all kinds of things at that time—overtures, symphonies, quartets, operettas, Church music, piano music, and so on. But now we remember him almost solely for his songs, and for a few orchestral pieces.

GERMANY'S GREATEST SONG-WRITER AND HOW HE COMPOSED A FAMOUS SONG

He is Germany's greatest classical song writer. He composed more than 500 songs, but, of course, only a small number of these are popular. The one we are most likely to hear is "The Erl King," the poem written by Goethe.

One afternoon Schubert took up a volume of Goethe's works lying on his table. He read "The Erl King." The rushing sound of the wind and the terrors of the enchanted forest were instantly changed for him into realities. Every line seemed to flow into strange, unearthly music as he read; and, seizing a pen, Schubert dashed down the song nearly as we know it. He got a great singer to sing it, and then a Vienna music publisher, who had hitherto declined to have anything to do with his songs, asked to have it. He paid Schubert a very small sum, though in a few months the publisher made $400 out of it. That was the way with Schubert all along. Some of his finest songs were sold for the price of a meal. Grinding poverty, slights, insults, disappointments innumerable—that was Schubert's portion. He died in 1828, before he was quite thirty-two, and they laid him to rest near Beethoven, at whose death-bed he had shed tears, with this inscription on his tombstone: "Music buried here a rich possession and yet fairer hopes."

THE MIGHTY BEETHOVEN, WHO WAS TOO DEAF TO HEAR HIS OWN MUSIC

We have still to speak of Beethoven. Recall Haydn for a moment. When Haydn was dying in Vienna, in 1809, the French were bombarding the town. Haydn's servants were terrified, but Haydn took it all very calmly. He asked to be lifted from his bed to the piano, and when he had got seated he played his own "Austrian Hymn" three times over, while the guns were thundering outside.

Now, at that very moment there was another composer in Vienna, crouching in a cellar, with cotton-wool stuffed in his ears. That composer was the mighty Beethoven. His hearing had begun to go, and he was frightened that the sound of the explosions would still further endanger it. Think of a musician being *deaf!* You might as well think of a painter being blind! Yet Beethoven, in some respects the greatest composer who ever lived, became almost totally deaf. The infliction embittered all his later years, and turned an originally lovable man into a kind of surly bear. Beethoven, like Handel, did not marry. He would throw the soup in his housekeeper's eyes when it did not please him, and stamp and rage and growl over the most trivial annoyances. Let us be charitable to him when we read of these things. It must have been awful not to be able to hear his own compositions.

THE HOME OF A BOY WHO WAS TO MAKE A NOISE IN THE WORLD

But Beethoven, apart from his deafness, had a very hard life. Born in 1770, at Bonn, that pretty little university town on the Rhine, where they have preserved his birthplace just as it was, he had to work his way up in a home directed by a father who was a confirmed sot. The father was musical, and he had heard something about the triumphs of the Mozart children in Vienna and Paris and London, and he thought he would make money out of his own Louis. So he set him to work at

the piano, and visitors would often see the child late at night shedding tears over the keyboard. By-and-by he was sent to Vienna to complete his musical education. There he met Mozart, who exclaimed, when he heard him play: "Pay attention to this youngster, for he will yet make a noise in the world." We know now how true that prophecy was.

THE DEATH OF BEETHOVEN IN VIENNA AND THE BIRTH OF CHOPIN IN POLAND

Beethoven's works for the piano—particularly his sonatas—are the grandest things of their kind ever written. All the great pianists regard him as the king of composers for their instrument. And so, too, with the orchestra. Take away Beethoven's nine symphonies—the "immortal nine," they are sometimes called—and we should take away the *backbone* from the orchestra. He did not write very much for the voice, for he was essentially an instrumental composer; but he left one beautiful song, "Adelaide," and one great opera, "Fidelio." He passed away in March, 1827, and Vienna never before saw such a funeral as his, the crowds being so immense that the soldiers had to be called out to clear a passage for the procession.

There was another great composer for the piano, and he wrote the most poetical, dreamy, emotional things that we are ever likely to hear from that instrument. The name of this composer was Frederic Chopin. He was a Pole, born near Warsaw, in 1809, and his music seems to breathe the romance that we commonly associate with his nation. He was a consumptive, and died early, in 1849, after a long struggle with disease and weakness. There was something feminine about him, but perhaps that is just why we find his music so refined, and so full of emotion and grace. He is really the poet of the piano—nothing strong and grand about him, like Beethoven—with an ethereal grace and charm such as we find in no one else.

MENDELSSOHN, A GENIUS WHO WAS BORN TO WEALTH AND HAPPINESS

Another great composer who met him in 1834 gave him the significant pet name of "Chopinetto." This was Mendelssohn, a German, born the same year as Chopin himself, by the way, who said of one of his pieces, "it is so perfectly beautiful that I could go on for ever playing it." One might say the same of several of Mendelssohn's own compositions. He was born to wealth and happy worldly circumstance, and never had to struggle with poverty or other ills. So his music is bright and genial, clever and pure, manly and refined. His "Songs Without Words" are among the classics of the piano; and his oratorio "The Elijah" ranks in popularity next to "The Messiah." It was written specially for the Birmingham Musical Festival—for Mendelssohn had a great affection for the English people, and liked London better than Berlin or Leipzig. He had a short life, but his early death, in 1849, seems to have been hastened by grief at the loss of a favourite sister.

A composer of a very different type was Robert Schumann, born at Zwickau, in Saxony, in 1810. There was no reason for his being unhappy, for his father was a publisher in easy circumstances. But there was a taint of insanity in the family. Schumann's sister died at twenty of an incurable melancholy; and Schumann himself spent his last years in an asylum, after trying to drown himself in the Rhine, near Bonn, where Beethoven was born.

SCHUMANN, WHO WROTE THE CHILDREN'S ALBUM, & WAGNER, WHO WROTE OPERAS

We can thus understand that his music is of a rather sombre cast. But we must remember, too, that he was the composer of that "Children's Album" of pieces which every little player of the piano gets acquainted with. Schumann wanted to be a great pianist, and to that end contrived a tiny machine of his own for exercising the third finger, which, we know, is not so supple as the other fingers. The machine hurt his hand, and he had to give up his ambition. But here again we have profited, for if Robert Schumann had been a great player, it is not likely that he would have been a great composer.

Now, there is just one more very great name to be mentioned, and that is the name of Richard Wagner. Musical people have been making a lot of Wagner in recent years, perhaps in return for the neglect he suffered during his life. He is not a composer in whom young folks can take a very deep interest, because he wrote little

HOW HAYDN PLAYED WHILE VIENNA BURNED

A hundred years ago, when the French army was firing upon Vienna, two men sat listening to the guns that thundered through the streets. In a cellar sat Beethoven, vainly trying to shut out the sound of the guns from his ears, lest they should ruin his hearing and make him deaf to music; in another room Hadyn struggled up in his bed, and with his dying fingers played the Austrian national anthem to try to drown the noise of the enemy's fire. It is a wonderful picture that this tale brings to our minds—the picture of two of the world's great musicians, whose music will live for ever, sitting, while life and power were ebbing from them—for Beethoven *did* become deaf, and Haydn died—helpless in the face of the great destroyer of mankind, the cruel curse of war.

but those great musical dramas upon which he prided himself so much, "Lohengrin," "Tannhäuser," "The Meistersingers," "The Flying Dutchman," "Tristan and Isolde," and the rest. He had an idea of his own about opera, and it was this—that the words are of equal importance with the music.

THE GREAT STORIES THAT WAGNER SET TO MUSIC

The older opera composers thought the music was everything, and the words of *their* operas were often silly to the verge of nonsense. Wagner changed all that, and if we read the words of his operas, we may enjoy the mere story perhaps almost as well as the music. He liked to deal with old German myths and legends, and we find his tales of Lohengrin and Tristan and Tannhäuser exceedingly interesting. He, too, was a German. He was born at Leipzig, in 1813, and had a very troubled career until the crazy King Ludwig of Bavaria, who was not crazy about music, took him up and gave him money and a home, which saved him to the world. He died in 1883, and he is buried at Bayreuth, where his final home was, and where he had created a specially constructed theatre for the performance of his works. There his widow, who was a daughter of Liszt, still lives.

Now we may turn to an Englishman, Sir Arthur Sullivan—born in 1842, died in 1900—who, when he was studying at Leipzig, was believed by his teachers to be destined to become England's greatest composer. We cannot call Sullivan a really great composer; but, at least, he must have our thanks for all the pleasure he has given by his delightful comic operas. He fell short of true greatness in his grand opera and his oratorio work, but we never think of that when we are listening to the tuneful melodies, the bright, sparkling choruses, and the charming instrumentation of that long string of familiar works which he wrote.

SIR ARTHUR SULLIVAN'S FAMOUS OPERAS, AND OTHER COMPOSERS

In these delightful works, from "The Sorcerer" and "H.M.S. Pinafore," on to "The Gondoliers" and "Utopia, Ltd.," he successfully established something altogether new in British musical art. His comic opera music "wears well," as we might say, and there is no reason why all these operas should not be as popular fifty years hence as they are to-day. Many people know Sullivan *only* by these operas. But he was a very versatile composer, and he wrote some fine hymn tunes which can never die. One of them we all know—the tune "St. Gertrude," sung to "Onward, Christian soldiers." And who does not know such songs of his as "Sweethearts" and "The Lost Chord"? For the first-named song he received $3,500 from the publisher, and the second brought him a handsome yearly income from the time of its publication onwards. Out of his comic operas he made more money than any other composer ever made out of music.

There are so many more composers to write about, when one begins to go over the names. There is Gounod, for example, the Frenchman who gave us the always popular opera of "Faust." There is Rossini, the Italian who gave us "William Tell" and the world-famous "Barber of Seville," and other operas that our fathers and mothers knew very much better than we do.

GREAT COMPOSERS WHO WERE NOT FOR ONE AGE BUT FOR ALL TIME

Verdi, too, we ought to remember for his "Il Trovatore" and "Aïda," and much later works of a more masterly kind. And Weber, also, for his "Der Freischütz," and Meyerbeer for his "Les Huguenots," and Donizetti for his "Lucia," and Bellini for his "La Sonnambula," and Balfe for his ever fresh and ever welcome "Bohemian Girl."

We ought to speak of Liszt, the greatest of all the great pianist-*composers*; and of Tschaikowsky, the Russian master, whose "Pathetic" symphony is now as familiar as anything of Beethoven's; and of Brahms, though his music requires much study and pondering, and is not very suitable for young people; and of Strauss, and then of Sir Edward Elgar, and of a great many more. Think of Bizet and his "Carmen," of Mascagni and his "Cavalleria Rusticana," of Leoncavallo and his "Pagliacci." And there are a host of others. The others, however, we are not very sure of just yet; but of these, the really great, we may safely say, in the words of Shakespeare, that they are "not for an age, but for all time."

The next Men and Women begin on 3327.

LITTLE AGNES OF THE SNOW

CONTINUED FROM 3168

UP among the mountains in the Lake District of England, shown in this picture, there used to be a cottage where a man named Green dwelt with his wife and children. Agnes, the eldest, was nine years old when one day in winter her father and mother went to an auction in the neighbourhood. The weather was fine when they started, and they kissed the children and told Agnes to look after the five younger ones, saying they expected to be back during the evening.

But, as gloaming came on, a thick mist settled down over everything, snow began to fall, and the children peered out into the gathering darkness and longed for their parents' safe return. Agnes was a brave little girl, and she did her best to take care of her brothers and sisters, gave them their supper, put the baby twins to bed, and talked to the others to prevent their crying for their mother.

By this time the snow was falling thick and fast, and soon it covered the path, and white lines showed under the door and through the crevices of the windows. Still there was no father or mother. At twelve o'clock Agnes heard her two brothers and little sister say their prayers, and then all crept into bed.

Next morning the cottage was nearly snowed up, and still there was no sign of father or mother. Little Agnes busied herself dressing the children and getting their breakfast. She opened the door and gazed on the mountains covered with snow. Could she get through that snow? Suppose her father and mother were lying in it just a little way down the path there. Should she try to find them? She shouted, but there was no reply, and she dared not leave the little ones.

The third day dawned, and it was snowing harder than ever, hissing as it came down the chimney and nearly putting out the fire. Still the children were alone, shut away from father and mother and the whole world, while the brave Agnes looked after them as well as she knew how, and encouraged them to say their prayers as their mother had taught them.

By next morning the snow had ceased falling, and little Agnes made up her mind to go forth to find out about her parents and to get provisions for the little family. She could not cross the beck, but went a long way round to Grasmere. She told her story, a search-party was formed, and her father and mother were found dead in the snow. Everyone who heard the sad story and knew of the bravery of Agnes was anxious to help the orphan children, and we are glad to know that they were well looked after.

THE BRAVE DIVER OF TORBAY

ONE summer day a torpedo-boat, practising in Torbay, Devonshire, came to grief, for her propeller shaft snapped and pierced her plating, so that the water rushed into her.

Some other boats came to her aid, but she sank in about half an hour. The crew, fearing the boiler would explode, had taken to the boats, and there, 150 feet down, the boat remained until it was decided to send divers to examine her.

Two men, Sidney Leverett and Walter Trapnell, came forward, and one light summer evening they were taken out, with all their diving apparatus, to where the wrecked boat lay.

Trapnell was let down first, and he soon sent up a telephone message that he had found the wreck. He was told to note the damage and to signal when he could be drawn up.

But no signal came, and the full twenty minutes, beyond which time it is dangerous for a diver to stay down at such a depth, had passed. What could have happened? The men in the boat pulled the life-line, but all they felt was a heavy weight.

Of the men in the boat, Sidney Leverett most keenly recognised that something serious was the matter with his mate. He sent down a message to ask what was wrong. Then, to his horror, he heard that Trapnell's lines were fouled, and he was unable to get clear. That meant that his friend was caught like a fly in a spider's web, and could not get away from the wreck.

Without a moment's delay, he slipped over the edge of the boat, and dropped down to the wreck. There he found his friend standing on the bottom, his life-line and precious air-tube entangled in the wreck. He worked hard trying to free him.

Every instant's delay added danger, for Trapnell had used up all the air available to him, and if he could not be freed soon, Leverett knew he would become unconscious and die. Every moment he himself was getting weaker and weaker, yet his friend's life depended on his quickness and skill. Once he felt it was hopeless to try any longer, but then he thought, "No, I cannot leave my mate. He must be saved. I won't leave him." So he struggled on patiently.

At last he set Trapnell free. Leverett signalled and sank into unconsciousness, while the men in the boat drew up the two divers very slowly, or the rush of fresh, pure air would kill them both. When they were at last freed from their diver's dresses, Leverett slowly recovered, but his poor friend, for whom he had risked so much, was so weak that he died the next day.

Yet the bravery, skill, and loyalty of Leverett had saved him from an awful death in darkness and loneliness at the bottom of the sea.

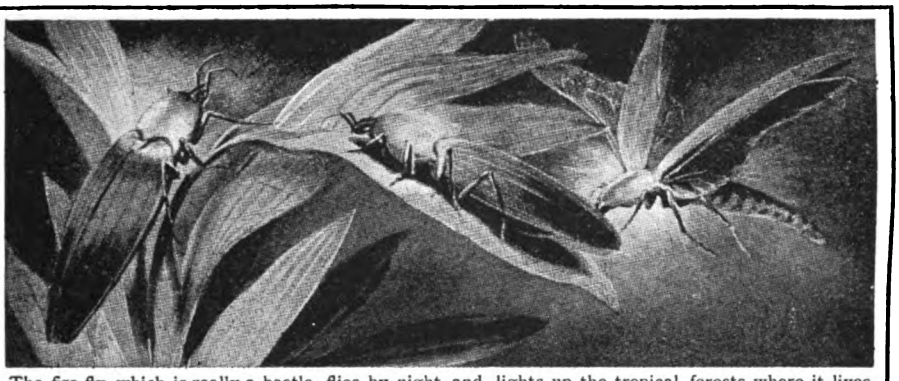
A GALLANT DEED OF A BOY KING

EVEN as a girl, Queen Elizabeth showed that independence of character which made her reign so remarkable. She and her little stepbrother, Edward, four years younger than herself, played together as children, and when they grew older, and were separated, the lonely boy missed the bright companionship of his sister, whom he called his "sweet sister Temperance." He was only a little boy of ten when he became king, and after that he rarely saw Elizabeth, and had to content himself with writing affectionate letters to her.

When he was only twelve years old he saved Elizabeth's life. One day, when the Thames was running high, the princess insisted on mounting her brother's horse, an animal only partly broken in. The horse dashed through the gateway, off in the direction of the river, and leaped over the palace wall into the water. Startled by the commotion, the boy king ran out to discover what was wrong, and when he heard what had happened to Elizabeth, he at once sprang into the saddle of another horse and followed her over the wall into the river. Good horseman as he was, he needed all his powers to reach his sister. She tried to spring on to his horse, but failed and sank. He dived after her, and, getting hold of his own horse, coaxed it to swim with them while he supported her, and at last the three got safely to the bank.

The photograph of Grasmere on page 3253 is by Mr. G. P. Abraham, Keswick.

THE NEXT GOLDEN DEEDS ARE ON PAGE 3471



The fire-fly, which is really a beetle, flies by night, and lights up the tropical forests where it lives with a million tiny, moving lamps. Travellers tie the fire-flies to their boots to lighten their path.

SOME INSECT FRIENDS OF MAN

CONTINUED FROM 3147

"WHAT'S the good of insects? You cannot plant them, and you cannot eat them." So said a member of the American Parliament not long ago, when it was proposed that money should be spent on protecting certain forms of insect life. Doubtless many British farmers would say the same thing if a similar course were suggested to them. Many of them do not take the trouble to distinguish between harmful insects and those which are their friends.

There was once a stupid fellow who saw a toad, one of the best friends of the gardener.

"Toad, are ye? I'll learn ye to be a toad," he said, and brought down his spade, whack! on the poor toad's head. That is just the sort of thing that the ignorant people would do with all sorts of insects. We have been studying some of the insects which are harmful to man, so we must be fair and look at the case of those which are our friends.

We will take in more than insects, too, for we will say a word for the humble worm, which is not an insect, as, of course, we know. Most people hate worms, and kill them when they can. Yet worms are industrious helpers of the farmer and gardener. Darwin studied their habits closely, and found that they help greatly in making our soil good and fertile. They eat the earth in which they live, just as the wood-borers eat the substance in which they make *their* homes.

The worms bring to the surface the earth which they have eaten. They make channels in the soil by which the air can enter and give the soil the nitrogen which it needs for making it fruitful. They carry down pieces of grass and straw, and these help the process. But most important is their work in bringing to the surface soil which has been lying below. Darwin found by calculation that the worms on a single acre of land bring up ten tons of dry earth to the surface every year.

Some savage peoples are really far wiser observers of Nature than we are. They realise the value of earth-worms. When a native of the Yoruba country, in Africa, decides to cultivate new soil for a farm, for what sign does he look? He looks for the evidences of earth-worms. Probably he has never taken the trouble to reckon up how much work the earth-worm actually does. He cannot go into figures as Darwin did. But he does know that the earth-worm makes the soil good for crops. So if he sees that worms are at work upon a tract of land, it is there that he sets to work to farm. If the land lacks worms, he knows that it is of no use his attempting

to farm, and he goes farther afield until he does find them. Probably few people who love the evidences of past civilisation think that they owe anything to worms. But they owe a very great deal. Those beautiful tessellated pavements which the Romans made in Britain have been preserved for us almost entirely by worms. They covered them with soil, in which they have been secure for a thousand years. But for the worms these precious relics of the past must long ago have been destroyed.

The most charming of all the things which bear the name of worm is a creature which is not a worm at all—the glow-worm. The glow-worms, as we call them, are really beetles, and do us good service by entering the shells of snails and devouring the occupants. Naturally, they move about at night, or they would not need the wonderful light which they are able to produce.

THE MARVEL OF THE GLOW-WORM AND ITS WONDERFUL LAMP

The light is phosphorescent, and is produced from fatty cells, to which run many tubes carrying the oxygen necessary for the light. The operation of this light is as wonderful as the operation of the batteries of the electric fishes. The rays of light which the glow-worm gives off are said to possess the same properties as the famous X-rays—they will pass through solid substances through which the eye cannot see. Men can produce light by gas and electricity, of course; but they cannot do as the glow-worm does—produce light without heat. This humble beetle has a power which man cannot imitate.

All the energy that it uses goes to making light, none is wasted in heat. The male glow-worm has wings, and flies about on summer nights, showing his light frequently, but for short intervals. The female has no wings, but shows her light to attract her lover. He is delighted when he finds her; but she is very heartless, and when he arrives she continues to flash forth her light to attract other males, so that she may have a number of them buzzing about her to sadden the heart of the first arrival, her real sweetheart.

The powers of the light given forth by the glow-worm are very great considering how small the beetle is. Placed in the dark, the glow-worm yields a light strong enough to enable us to read print by it, or to tell the time by a watch. There are hundreds of species of this beetle and other light-giving beetles.

THE FIRE-FLY THAT IS REALLY A BEETLE AND LIGHTS UP THE FOREST

The fire-flies, like the glow-worms, are really beetles. We have none of these, unfortunately, in our country, and our dark nights show none of the glories of the nights of warmer lands. In Ceylon, in South America, in the West Indies, and in some parts of Canada, among other places, the forests at night are like dream lands or fairy worlds. The fire-flies wing their way in countless swarms around the trees, lighting up the foliage as with gleaming diamonds. After rain the air seems filled with trains of flashing stars, waving about the tree-tops in glowing circles, making the scene such as might inspire the mind of poet or painter.

These wonderful creatures have their real use, as well as beauty, for the traveller. Men who would not dare to pass, unlighted, through the forests at night attach the fire-flies to their boots to light the path they tread. Thus lighted, a man goes on his way as in daylight, and when the sun gets up, he gratefully replaces his living lanterns on a shrub so that they may live to serve others in the same way.

Certain birds use the fire-flies to light their nests. Natives make lanterns of them. Spanish ladies wrap them in gauze, and use them as ornaments for their hair; and young people decorate their dresses and the harness of their horses with them.

A LITTLE FLY THAT FIGHTS FOR MAN AND SAVES OUR GARDENS

We must leave these beauties, however, and pass to another noted family which is famous, not for its beauty, but for its service to man. This is the family of ichneumon flies, with whom we have already made acquaintance. There are thousands of species, and it is safe to say that men engaged in agriculture would be helpless without them. They lay their eggs in the bodies, or even in the eggs, of harmful insects, and so destroy these while multiplying themselves. How this is done we have seen in our story of the caterpillars. That is one way. The female has what is called

THE WORM, THE LADYBIRD, & SOME FLIES

Although the common earth-worm is sometimes a nuisance, it is really one of the greatest friends of man, draining and ventilating the soil, and turning it over and over. The great scientist, Darwin, wrote a whole book about worms

The ichneumon flies destroy many insect pests. The female lays her eggs in the larvæ of other insects, and these hatch and feed upon the living victim. On the left we see a caterpillar from which twenty ichneumons have emerged. Next is the ophion ichneumon, and last of all the long-tailed ichneumon.

On the left is a dragon-fly grub feeding upon an insect, and on the right a fly emerging from its grub-skin.

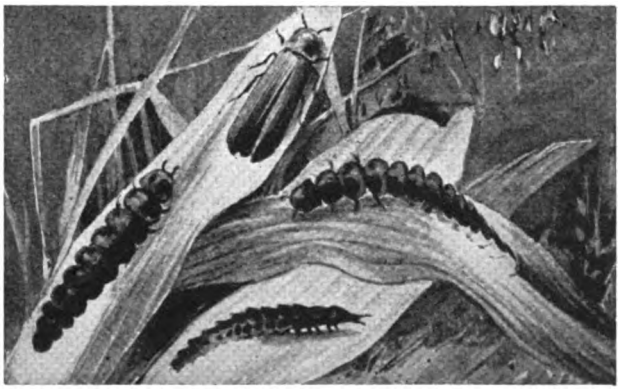
Born in water, the dragon-flies live in air, and they get their name from their fierce preying on small insects.

This dragon-fly is at rest. Dragon-flies are sometimes called "horse-stingers," but they do not sting horses.

On the left we see a dragon-fly's empty chrysalis case.

The other three pictures are the bot-flies of the horse, the ox, and the sheep. They are the real gad-flies, although the harmless dragon-fly is often called by that name. Bot-flies are terribly destructive to our domestic animals, to whom they cause very great suffering.

The gardener has no better friend than the ladybird, for its larva destroys the mischievous green-flies. Here we see some ladybirds that were wintering under a haystack.



Like the ladybird, the glow-worm is really a beetle, and it does good service by devouring snails. Here we see the glow-worm and the beetle of which it is really the larva. The female shows a much brighter light than the male, and this light, which is in the tail, will illuminate an inch or more round the creature. Country people call glow-worms "stars of the earth."

The photographs on these pages are by F. P. Smith, W. P. Dando, B. Hanley, P. Collins, S. Johnson, D. English, W. S. Berridge, J. Ward, J. Lyle, and others.

an ovipositor. This is a sort of combined spear and tube. With the spear she makes an opening in the body of the insect in which she is going to deposit her egg, then, having made it, she produces an egg from the tube, and leaves it in the victim's body. Sometimes an ichneumon will lay its eggs in the body of another ichneumon, but generally they choose other insects, and chiefly keep each to its own class of victims. Let us watch one at work on a rose leaf.

THE BATTLE FOR LIFE BETWEEN AN INSECT PEST AND AN INSECT FRIEND

Although the aphides make very good cows for the ants, they are terrible enemies of our rose-trees, whose leaves they spoil by robbing them of their life-juice. Down comes an ichneumon fly. She walks on her high, stilt-like legs, over the leaf until she sees a plump aphis. She touches it with her antennæ.

If the aphis were thus touched by an ant it would quickly produce some honey, but now it knows that a deadly enemy is at hand. It begins to wriggle violently to escape the doom which instinct tells it is near. The fly may wait until the aphis has finished wriggling, or may even give up and go to another victim. But in the end she is successful. One thrust of her lance in the back of the green-fly's neck makes the nest of the egg. In that wound the egg is placed, and the ichneumon, having fifty or sixty such eggs to place, hurries on elsewhere to continue her task.

The aphis does not die. It knows what has happened, and, leaving its companions, crawls away to a leaf to be all by itself. Presently the egg hatches, and the grub which leaves the cell lives upon the flesh of the aphis. We can only hope that the latter feels no pain. It seems a dreadful story, but naturalists suppose that the aphis suffers a sort of paralysis, which mercifully prevents it from feeling discomfort.

THE TINY FLY THAT KILLS THE FOES OF THE COTTON PLANT

When the grub has reached a certain size, the aphis dies. Then the grub makes its way out of the dead body and spins a silken cocoon for itself in which it undergoes changes, and finally comes forth as a winged ichneumon fly. In that stage it lives upon the juices of certain flowers, and in its turn goes out to find aphides in which to deposit its own eggs. But for the ichneumons, men would be helpless against the attacks of caterpillars, green-fly, and other things of the same sort. The blessing is that they make their attacks upon insects which are among the most numerous in the world, and from which we suffer most injury.

There is a very important ally of the ichneumon fly of our gardens called the chalcid fly, a fly of many species. Probably the people of Lancashire do not think much about it, but their prosperity as the greatest cotton manufacturers in the world depends very largely upon these tiny flies. The cotton plant has terrible insect enemies, and the chalcid flies are the only things to keep them down. The chalcid is no match for the fully developed insect, but scientists have found that it destroys millions of the eggs of these larger insects, and so saves the cotton plant from being ruined by the grubs which would issue from the eggs if the latter were left undisturbed.

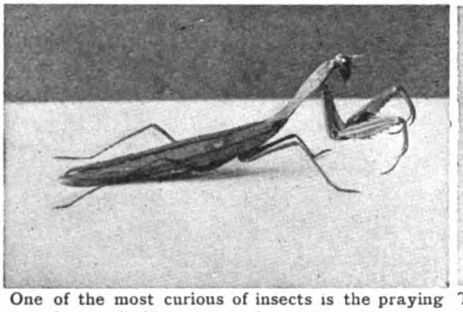
A FLY THAT HAS CROSSED THE OCEAN TO MAKE POOR FRUIT RICH

Another thing that one of the chalcid flies does is to give figs to California which now rival those of Smyrna. Smyrna figs have been from early times the best figs in the world. Farmers in California bought trees from Smyrna, and made them grow in California, but the fruit was not the same. Clever men of science studied the problem and solved the mystery. They found that the Smyrna fig-tree is the home of a chalcid fly which, with its saw-like weapons, cuts into the fig-bud, and so introduces pollen which makes it big and sweet and rich. Chalcid flies were therefore placed upon the trees in California, and the figs grown there under these conditions are said to be as good as those of Smyrna. Here, then, are two examples of the great value to men of some of the smallest of Nature's offspring.

The ladybird is another of our friends in this country. People have such a horror of anything called a beetle that it is just as well that the ignorant do not know that the ladybird *is* a beetle, or, in spite of its great work for us, it would be killed by the stupid. We like to pet the ladybird because it is so pretty and so fearless. But its real value to us lies in the fact that it eats

INSECTS THAT DO GOOD IN OUR GARDENS

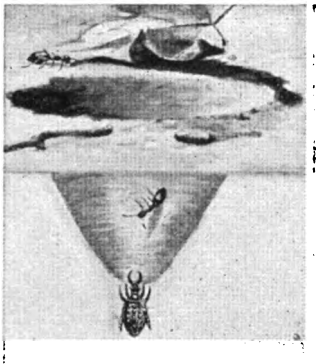
The lace-wing fly lays each of its two or three hundred eggs on the end of a tiny hair. The larva feeds upon plant lice.

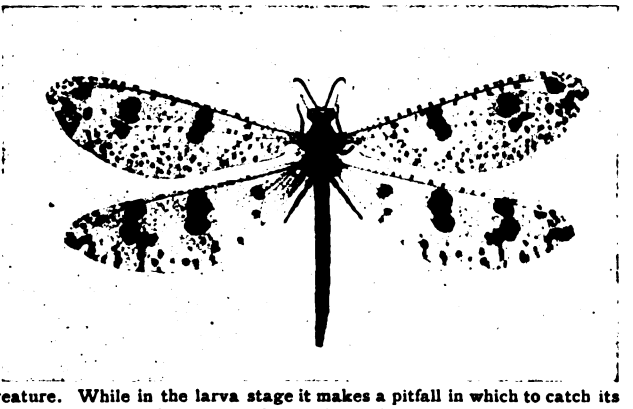


One of the most curious of insects is the praying mantis, so called because the front legs are held up as in prayer. It is not found in the North, but in the Southern States; is useful in killing harmful insects.

The May-fly, related to the termite, spends two years in the water as a chrysalis, and dies the day it flies.

Here we see the whole life-history of the caddis-fly. On the left are the fully developed creatures, flying and at rest. Below is the grub, and the other figures are grubs emerging from the curious cases that they make for themselves. There are many kinds of caddis-flies in America, and they make their cases of different materials, some of twigs and leaves, others of grains of sand and stone, and one of the shells of water snails.





The ant-lion is a most interesting creature. While in the larva stage it makes a pitfall in which to catch its prey. It hides at the bottom, with only the tips of its jaws appearing, and here it waits until an ant or other creature rolls down, when the ant-lion seizes it in a moment, and devours it. In the left-hand picture we see the ant-lion larva in its pit about to seize a victim, and on the right is the perfect ant-lion, looking like a beautiful dragon-fly.

the insects which destroy our plants. One species lives entirely on the aphis, the rose-pest; other species live on those tiny animals which we call scale insects—the things that ruin hops and fruit-trees. The young lady-birds might be in danger of being killed if people did not see them devouring the plant-lice. They are so unlike their parents. They look like tiny crocodiles when they first begin to run about the leaves on which they have come from the egg. Soon, however, it is seen that they are hunting aphides, and then their mission is realised to be one of value. The full-grown ladybirds have to seek warm retreats in the winter, and it is then that many get into our houses. They can be safely handled and examined. If they are roughly treated or alarmed they have the power to emit a yellowish fluid with an unpleasant smell.

How insects were brought from New Zealand to save our hops

So valuable are the ladybirds that they are sent from country to country. A cargo was sent to California to destroy the scale insects which were killing the orange-trees there. These were so successful that a cargo was brought from New Zealand to England to cope with the scale insects which were multiplying on our hop plants.

Unfortunately this was not such a success. The climate did not suit the little visitors so well as that of their native land. They found the hop plants too high for them, and refused to seek higher than three feet from the ground. Finding the work so unsuitable for them, they gradually forsook the hops and worked away at the scale insects in the currant-bushes in the nursery gardens.

The beautiful dragon-fly is another of the creatures which are commonly misunderstood. It has a spear-like tail, and when threatened curls this up and down as if it meant to sting. This might frighten a larger enemy; it certainly frightens ignorant human beings, who call it the "horse-stinger" and kill it, when they can, in the belief that it is an enemy. They kill a very good ally by so doing. The dragon-fly, though it does not and cannot sting, is a sort of king of our insect world. It lives on other flying insects, and when we see it dashing about in the air like a flash of light, it is simply hunting prey which, if left, would injure us. Its powers of flight are marvellous, and it is impossible for a man even with a big, long-handled net to catch them when they are flying.

The gorgeous dragon-flies that travel as fast as trains

They seem to know exactly what he means to do, and no matter how swiftly he may move, no matter how cunning he may be, they always manage to keep just out of reach of his net. They must be caught when at rest, if at all. It is the swiftness of their darting, swallow-like flight which makes them so certain of catching mosquitoes and other insects on the wing. They can catch insects when flying at the rate of forty or fifty miles an hour.

To enable them to make their rapid pounces in all directions, they need fine eyesight. And they have almost, if not quite, the finest eyes in the insect world. Their nearest rivals in this matter are the butterflies and day-moths. Not only are their eyes big; they are compound, made up of an enormous number of facets, each of which is an eye to itself. The dragon-fly has practically from 15,000 to 20,000 eyes in each of its eyes, and through each tiny angle can see as clearly as we can see with *our* eyes.

It must not be thought that the dragon-fly is an exception in having these marvellous compound eyes. The point is that the eyes of the dragon-flies differ in degree of strength, not in kind, from the eyes of other insects. Insects nearly all have these compound eyes. Our common house-fly, for example, has thousands of cone-shaped eyes bound into one big cone-shaped eye, and each facet is a separate self-working eye, though part of the greater eye.

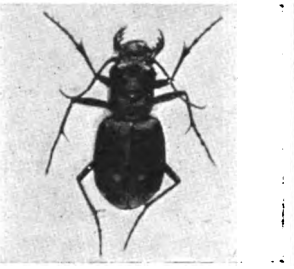
An insect with twenty-five thousand windows to its brain

The house-fly, as he darts across the kitchen or into the larder, has 8,000 chances of seeing food or the cream-jug. The common beetle has 6,000 chances of seeing something worth looking at, while the mordella beetle has over 25,000 windows to its brain.

We must not leave the dragon-fly without a word as to the manner in which he came into the world. His life-story is similar to that of the

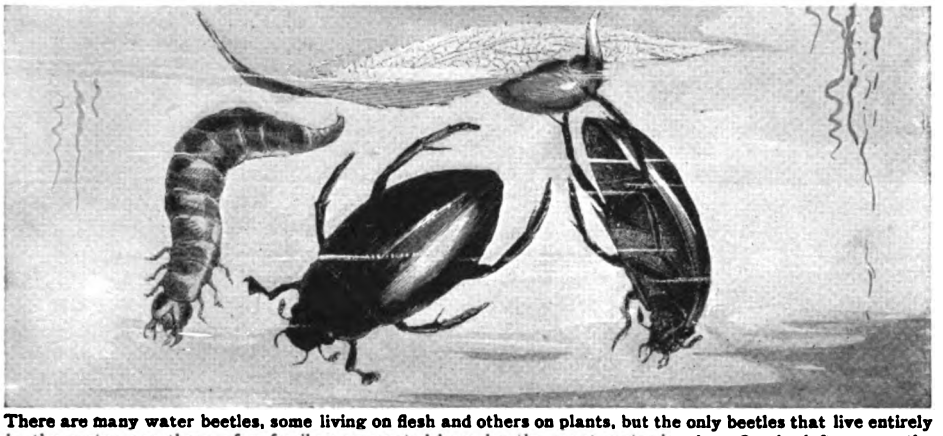
SOME BEETLES THAT ARE USEFUL TO MAN

The tiger beetle is the most perfect example of a beetle that exists, and no insect is more tiger-like in the way it preys on other small creatures.

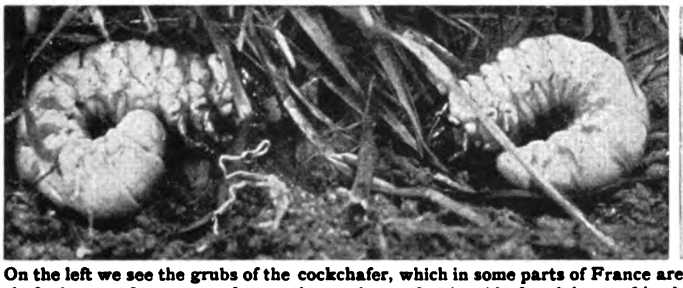


Here we see the tiger beetle's formidable jaws open. It rarely misses the prey it pounces upon, and is a most useful friend in our gardens.

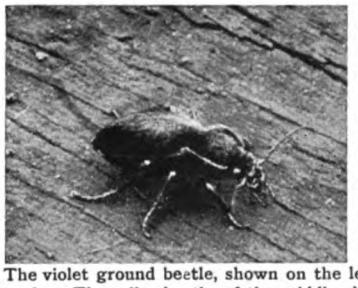
The rove beetle, or devil's coach-horse, is so called from its wandering habits. When meeting an enemy it raises its tail, as shown in this picture

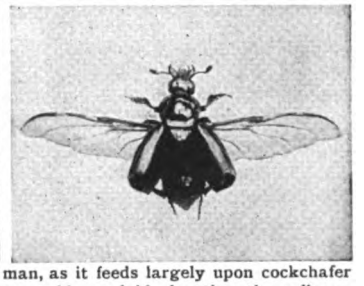


There are many water beetles, some living on flesh and others on plants, but the only beetles that live entirely in the water are those of a family represented here by the great water beetle. On the left we see the larva, then the male beetle, and on the right the female with her egg cocoon fastened to a floating leaf.



On the left we see the grubs of the cockchafer, which in some parts of France are fried and eaten. The cockchafer is one of our worst foes, and were it not for the aid of such insect friends as the ground beetles, they would devastate whole districts. Another destructive insect is the summer-chafer, shown on the right. It is so much like the cockchafer, though somewhat smaller in size, that it is often mistaken for a young cockchafer.





The violet ground beetle, shown on the left, is a valuable friend of man, as it feeds largely upon cockchafer grubs. The cellar beetle of the middle picture is common in old houses, and is much blacker than the ordinary black beetle. On the right is the burying beetle, shown at work on page 3264, with its wings extended.

mosquito. The eggs are laid in fresh water, and hatch there. The larvæ eat very hungrily, strong nippers in front enabling them to grasp and eat quite big insects and other forms of food. Their breathing is very curious. In a way it is like that of a fish. They have no windpipe or lungs, of course. The water enters the lower part of the body, where many little tubes extract from it the oxygen necessary to the insect's life. Then the water is forced out again, and the pressure of the water going forth is sufficient to drive the larva on its way without its troubling to swim by other means. When the time for a change comes, the larva crawls wearily up the stalk of a plant. He is feeling far from well. There he rests for a while. Suddenly the dull old coat in which he has been floating about splits down the back, and lo! a gorgeous dragon-fly creeps forth. He has wings now, small and damp and crumpled; he would be helpless if an enemy sought him. But he waits, and the sun dries him, and his wings harden and expand, and very soon he rises into the air in all the majesty of four splendid wings, and with a coat of mail bright and shining as the mail that the knights wore in days of old.

THE BEAUTIFUL DRAGON-FLY AND THE HARMFUL GAD-FLY

Sometimes we hear the dragon-fly called the gad-fly. There could not be a greater mistake. The gad-fly is another name for the bot-fly, one of the greatest enemies we have. The horse-bot lays her eggs on the hair of the horse, in some place where the horse will be sure to lick itself. The eggs cling to the tongue of the animal and are swallowed. They remain in the stomach of the horse all the winter, and, leaving the body of the horse in the spring, burrow into the ground, and there become flies.

The ox-bot is more generally known as the warble-fly. This horrible creature serves the cattle as the ichneumon fly serves the aphis and caterpillar, boring a hole in the hide and laying its egg there. Cattle are terribly afraid of the warble-fly, and will sometimes gallop themselves to death to escape it.

The sheep-bot is the worst of all, for this crawls into the nostrils of the sheep and lays its eggs there, where the grubs, on hatching, sometimes crawl into the brain of the poor sheep and kill it. These are the gad-flies, so we must never again confuse our gay friend, the dragon-fly, with them.

The dragon-fly and the mosquitoes are not by any means the only insects which undergo such surprising changes, being born in water, to fly in the air. The same course of life is followed by very many others with which we can afford to be on the very best of terms.

THE SNUG LITTLE HOUSE THAT THE CADDIS-WORM BUILDS

The caddis-fly, for example, deserves a chapter to itself, could we spare the space. The eggs hatch in the water in which they are laid, and the grubs are called caddis-worms, which fishermen are only too glad to secure for bait. They make the most wonderful nests for themselves in which to pass their days under water.

They gather bits of sticks and leaves, grains of sand, and tiny fragments of shell, and cement them all together to make the snuggest of houses. Some cut leaves and twigs into short lengths, and cement them together to form a tube. Others build up a home made of shells, in which the little animals to which they belong are already living, and the living molluscs are fastened round to make a live belt or shield for the caddis-worm.

Inside these tubes the caddis-worm spins a robe of silk which leaves its tail covered, but permits its head and legs to come out, so that the larva may collect its food of vegetable or animal substance. When they are to undergo their change, they close up this front door, either with plates of silk or with stones, so that the water may come through, but not animal enemies. Before the great change quite arrives, the larva must come out again, quit its cell for ever, and climb up on to a plant, where its shell will split open and it will appear as a pretty winged insect, the caddis-fly proper.

THE MAY-FLY THAT LIVES THREE YEARS IN WATER AND ONE DAY IN AIR

All this discussion of insect changes must have made us think of the life of the May-fly, or day-fly, as it is also called. The story of its life in the water is similar to that of the other insects of which we have been reading. But here the life in the water may last for two or three years. In that time the larva lives a busy life, hunting and feeding on

other insects, making itself dwellings in the sand or mud, and slowly, very slowly, preparing for the time to come. Finally, the great day arrives; the pupa stage has been passed, and the insect climbs out of the water all ready for flight, except that it is still wrapped in its pupal robe. This has to be worked off, and then the May-fly mounts into the air. The flies may be seen in millions and millions on a summer evening, dancing and eddying in the warm air over canal or pond or stream. Their lives in the air never last more than a day. Often only an hour passes between the time of their leaving the water and their death. In that short time the females lay hundreds of eggs on the leaf of some water plant. Then they die. Their life in the air has begun and ended in, perhaps, an hour, after they have spent years in the water preparing for it; and at the end of that hour their dead bodies lie in such multitudes that they may be swept up and strewn on the fields for manure.

THE CUNNING ANT-LION THAT DIGS A PIT FOR ITS PREY

It is to this order of insects that one of the most extraordinary—the ant-lion—belongs. After it has undergone its change, the ant-lion becomes a pretty fly, but it is while in the larva stage that it most interests us. It makes a pitfall in which to catch its prey, and this is the way in which it does it: selecting a dry, sandy spot, it first marks out a circular furrow; then it places itself in the centre, and, half burying itself in the sand, it begins to dig. It uses one of its legs as a shovel; with this it throws up the sand on to its head, with which it jerks the material out of the circle and beyond the furrow. In the cleverest way it thus makes a tunnel down into the ground, funnel-shaped, two or three inches wide at the top, and narrowing down to the bottom.

When the work is finished, the ant-lion practically buries itself in the sand at the bottom of the pit, and waits, listening, for an insect to come along. Presently, down topples an ant or something else; the ant-lion springs from its hiding-place, and, seizing the victim with its strong jaws, holds it until it has sucked all the juices from its body, then it throws the body out of the pit and waits for more. Should the prisoner be skilful enough to escape from the ant-lion and start to crawl up the side of the pit, the ant-lion at once flings up sand or earth with its head, and so causes the runaway to fall down again. These adventures suggest the doings of the trap-door spider, but we shall come to that in the next story.

THE PRAYING INSECT THAT HELPS MAN BY KILLING INSECT PESTS

We turn now to another famous insect, the praying insect, or praying mantis, as it is called. These do not live in the Northern States, but so many pictures have been published that we are all familiar with their appearance. Though they can fly, they do not pursue their food on the wing. They wait on trees or shrubs until an insect draws near. The head is bent down and inwards, the long, powerful front legs are folded and held up as if the creature were praying. But the instant a fly or other insect draws near, the big front legs shoot out and seize it, and down the throat of the mantis it goes. We must regard it as a friend of man, for it kills and eats a great number of injurious insects. There is one species of mantis in India which is most wonderfully coloured, so that when it rests it looks like some gay orchid. Insects approach it believing it to be a pretty flower, and are at once seized and gobbled up.

Going to the opposite extreme we come upon the up-curving body of a very fierce-looking beetle. We point a stick or a finger at him, and he opens his strong jaws and curls up the back part of his body, and looks ready to fight. And so he is. He is the big rove beetle, which we call the devil's coach-horse. For all his black, ugly body, his threatening looks, and the nasty fluid which he emits when attacked, he is a prime favourite with all gardeners who study natural history.

HOW THE DEVIL'S COACH-HORSE SLAYS A CATERPILLAR

His appetite is as big as his courage. The devil's coach-horse will attack any insect, no matter how big. With a snap of its great jaws it will cut caterpillars or earwigs in half, and make a meal of them. Snails and slugs are among its dainties, and it will eat any carrion which it may find. The devil' coach-horse belongs to a big family of

rove beetles. One of the family is to be found among the pets in the ants' nests of which we have read. They keep it because it gives them honey.

We have read so much about eggs deposited in the bodies of live creatures that we may turn now to beetles which choose dead bodies for the purpose. These are the famous burying beetles. They are to be seen in England, and it was the study of those here which led to the discovery of many interesting forms abroad. We never see them unless there happens to be a mole or mouse or some other small animal lying dead in the garden. Then they come up as if from nowhere, husband and wife, busy as can be, and claim the body as if they had bought and paid for it. Folding up their wings, they at once begin to dig.

These curious sacred beetles are rolling a ball of refuse to their hole. When they have got it there they feed on it ravenously, hardly stopping to rest. They are called scarabs, and were worshipped by the ancient Egyptians.

If the soil on the spot is not of the right sort for their work, they drag the dead animal to some place more suitable. To do this requires extraordinary strength in beetles, but they have very powerful jaws. The digging begins with a circular furrow like that made by the ant-lion, and then another is made within that. They keep digging away until the body begins to sink. When it has sunk far enough they throw over it the earth which they have excavated. Then they feast upon the body, and the female lays her eggs in it, so that when the larvæ hatch they shall find food ready to hand. Then off they go again.

Here we see a pair of burying beetles busy at work on a dead dormouse. They will dig round the body until it sinks into the ground and then they will eat part of it, and the female will lay her eggs in the remains of the carcase.

Of course, these are not the only beetles to bury things. The sacred beetle of Egypt does it, too. This beetle, whose proper name is the scarabæus, belongs to a numerous family. It collects refuse, makes it into a ball, and rolls it into its hole in the ground. There it feeds untiringly, for a fortnight at a time, without resting, until the mass is gone. In other balls of refuse it deposits its egg, and from this, in due course, the young scarab issues. The Egyptians used to think that the old scarab died on entering the ground, and that the young scarab was the same beetle resurrected. Many other silly traditions of this sort came to be associated with this beetle, and it was as sacred to the Egyptians as the ibis. They worshipped it while it was alive, and after its death embalmed it, just as they embalmed their own monarchs. And yet it is only a scavengering beetle of very unpleasant tastes.

Returning to our garden again we must say a word for another beetle or two. Nearly every one that we find there is a friend, living upon injurious grubs and insects. The tiger beetle and the violet ground beetle deserve special mention as among helps of the gardener. The tiger beetle has about a thousand species, but the majority of them are in the hot lands. Ours are pretty and active, and possess great jaws and powerful wings. They live entirely on insects. The list of friendly insects is far from complete. There are, indeed, thousands and thousands of different sorts of insects that are harmful to us, and there are probably just as many that help us. We can all extend our knowledge by personally watching the daily lives of the insects around us in our gardens and elsewhere.

The next story of Nature is on page 3295.

THE NOVELS OF THACKERAY

MOST of the famous novels written by W. M. Thackeray, whose life is told on page 2311, introduce us to characters whom we seldom grow to like so well as we do those of his great contemporary Charles Dickens. Of course, there are exceptions to these among his stories, for he was a gentle-hearted, lovable man himself, and could scarcely have failed to give us some lovable characters. The first of his novels chosen for reading here is, in many respects, his best; perhaps it is not too much to say that "The History of Henry Esmond" is the finest historical novel ever written. It is the most charming of all his works, Henry Esmond and Lady Castlewood being two of the noblest characters he ever created. The story was first published in 1852, and a sequel to it appeared six years later, entitled "The Virginians," the story of which we shall read after that of "Henry Esmond."

HENRY ESMOND

A ROMANCE OF THE DAYS OF QUEEN ANNE

CONTINUED FROM 3053

IN the latter days of William III. and during the reign of Queen Anne, when there were many people in England darkly scheming to restore the crown of this country to the son of James II., the events of this story are supposed to have taken place. Concerning the birth of Henry Esmond, it is necessary to know something at the outset, as much of importance later depends upon that. There was a certain Thomas Esmond, who had been to the Low Countries in the train of the Duke of York during the wars, and there he had married a weaver's daughter. They had one son, named Henry. Thomas Esmond, soon deserting his wife, returned to England, and the unhappy woman entered a convent, where eventually she died.

Succeeding to the title and estates of his uncle the Viscount Castlewood, Thomas Esmond married his cousin Isabel and kept his earlier marriage a secret. Although he was in many respects a rascal, the new viscount was not without some touches of good-nature, and on hearing of his first wife's death he had his little son Henry brought over to his fine ancestral home of Castlewood and placed in the care of his chaplain, Father Holt.

This was done, however, without his acknowledging the fact that little Henry was his rightful heir, or even admitting that he was his son. Indeed, the little fellow, as he grew up and gradually began to understand what others thought of him, gathered that he was supposed to be called Esmond by courtesy and not by right.

The Esmonds, though not all Roman Catholics, had, as a family, been loyal to the Stuart kings; and Father Holt, who was Henry's tutor, was a very active spirit in the Jacobite plots to restore James II. to his throne. Castlewood was, indeed, a centre of political intrigue. The Esmonds had made many honourable sacrifices in their devotion to the Stuarts; and, when James II. made his historic effort against William III. at the Battle of the Boyne, Thomas Esmond fell fighting for the defeated king. His widow Isabel, having been as strong a Jacobite as her husband, fled from the mansion of Castlewood and secluded herself in her house at Chelsea. Father Holt had also to take himself off, and little Henry was thus left alone with the servants at Castlewood, wondering what it all meant and feeling very lonely.

Soon, however, the new Viscount Castlewood, Colonel Frank Esmond, a bluff and hearty man of forty-five or fifty, came to take possession of the house and estates he had inherited from his deceased kinsman. With him came his wife, who was but twenty years of age, and their little daughter Beatrix, a lovely child of four, who kissed her cousin Henry the moment

they met, though she had never seen him before. There was also a baby-boy, carried in his nurse's arms. These were the four new friends with whom the life of Henry was now to be entwined.

When the young Lady Castlewood asked him his name he said, "My name is Henry Esmond," and looked up at her in a sort of delight and wonder, for she appeared to him the most charming object he had ever looked on.

HENRY SEES A VISION OF BEAUTY AND BEGINS A HAPPIER NEW LIFE

Her beautiful golden hair was shining in the gold of the sun; her complexion was of a dazzling bloom; her lips smiling, and her eyes beaming with a kindness that made Henry's heart to beat with surprise. Her beauty, both of body and mind, was to be a guiding star to him through life; and little he guessed how dear they would become to each other, for although a lady of twenty is quite an elderly person to a boy of twelve, a time soon comes when the eight years of difference count for nothing.

Lady Castlewood was a devoted wife, but her lord was not the best behaved of husbands. She served and tried to please him in every way, she watched over her children with loving care, and treated Henry with a gentleness he had never known before, so that a new and happy life was opening out for him, when, by a strange fate, he became the innocent cause of much unhappiness to her ladyship.

On a visit to the village he had somehow caught the infection of smallpox, and on this being discovered at Castlewood, my lord made it an excuse for betaking himself to town with Beatrix.

HOW HENRY WAS THE INNOCENT CAUSE OF LADY CASTLEWOOD'S UNHAPPINESS

Lady Castlewood and little Frank, who stayed at home, also caught the disease; and when her ladyship recovered she had lost that delicate beauty of her skin which had first charmed the eye of her husband. When the viscount returned he did not disguise his disappointment at the change which the disease had made in his wife, and she never forgave the look he then gave her.

In due course Henry was sent to Cambridge University to study for the priesthood, and when he returned for his first vacation he found as a guest at Castlewood and a boon companion of the viscount a certain Lord Mohun, whose evil reputation was known throughout the country. Lady Castlewood was now clearly unhappy in her husband's conduct, while he, whose drinking habits were evidently growing, complained to Henry of how she treated him, saying, "It's been that way ever since you brought the smallpox into the house."

Her ladyship naturally disapproved of her husband's friendship with the notorious Mohun; and when Henry returned from Cambridge a second time he found his lord and lady openly unfriendly with each other, and Mohun again a guest. Castlewood seemed to grow more reckless in his conduct, and one night before his wife he went so far as to say to Miss Beatrix: "When thou art old enough, Trix, thou shalt marry Mohun!" At this Beatrix laughed, and said Mohun had had a long talk with her mamma the night before.

"Ask Lord Mohun what I said to him, Frank," said Lady Castlewood, with great dignity, and taking her daughter by the hand, she swept out of the room.

A QUARREL BETWEEN TWO NOBLEMEN AND WHAT IT LED TO

"I will tell you what your wife said to me," said Mohun. "She asked me not to drink and gamble with you any more. You know best whether that was for your good or not."

"Oh, of course!" sneered Castlewood. "You are a model man, my lord."

"I am no saint, though your wife is," retorted Mohun. "And I can answer for my actions as others must for their words."

"When you please, my lord," said the viscount.

These words betokened the prospect of a duel, and Lady Castlewood was in great fear that such might be the case. But Mohun left the house next day, apparently on good terms with Castlewood. Soon an uneasy sense of trouble was felt by all at Castlewood, as the viscount grew moody and silent and had much business with his lawyer.

In about a month he declared that he was ill, and required to see his doctor in London. Henry was asked to accompany him; and at a tavern in the city his lordship met Mohun and others, and engaged in a game of cards, in the course of which Mohun and Castlewood

quarrelled. Henry could see at once that the whole thing had been arranged, and presently, as the party proceeded to Leicester Fields to fight a duel, Castlewood confessed to Henry that such was the truth. Mohun, he said, had written an insulting letter to Lady Castlewood, which he had intercepted, and he would have challenged him earlier only that he had first to pay off the betting debts he owed to him.

Almost before Henry had quite realised what was happening, the duel was over, his misled but good-hearted master mortally wounded. It was a momentous event for him, for just before the viscount died, he handed him a document which disclosed the truth about his birth, and proved him to be the real heir of Castlewood, the secret having been told to the viscount by the mysterious Father Holt.

What was Henry to do with this proof of his fortune? To claim the title and estates meant to dispossess young Frank, and to add to the already heavy sorrows of his beloved mistress. He threw the paper in the fire!

HENRY ESMOND MAKES A GREAT SACRIFICE AND IS ILL-REPAID

This great act of self-sacrifice seemed to be badly rewarded when Lady Castlewood visited him in prison, where he was lodged for a time for his part in the duel. She reproached him bitterly for not preventing her husband's death. Distracted with grief, she was unwittingly cruel in what she said to him, and she left his presence declaring she never wished to see him more.

On being released, Henry had now to give up all thoughts of becoming a priest. But as the Lady Isabel offered to help him, he did not hesitate to accept her help, knowing how much more was within his right. Thanks to her, he secured a commission in the army, and for more than a year he saw much active service, winning the rank of captain. On his return to England he was greatly disturbed to hear that Lady Castlewood was expected to marry the Rev. Tom Tusher, a characterless creature, who was chaplain at Castlewood. This he determined to prevent at all costs, ignoring the fact that her ladyship had asked him never to see her again. So he posted off to Winchester, where she was staying; and there, in the solemn old cathedral, still in her widow's dress, he found her at evensong, and by her side her son Frank, now grown into a handsome youth. As the service finished, Frank saw him first, and rushed to Captain Esmond with an eager welcome; while Lady Castlewood said:

"It was kind of you to come back to us, Henry. I thought you might come."

LADY CASTLEWOOD AND HENRY ESMOND BECOME GOOD FRIENDS AGAIN

She gave him her hand—her little fair hand. There was only her marriage-ring on it. The quarrel was all over. It was just as though they had never parted. And, best of all, there was not a word of truth in the story about my lady and Tom Tusher, which had been told to Esmond by the spiteful old gossip, Lady Isabel.

As they walked homeward in the gathering dusk of the winter's day, Lady Castlewood told Henry of her joy in having him back again. And he, in his new happiness, proposed that they should never part.

"Come away," he said. "Leave this Europe, which has so many sad recollections for you, and begin life again with me in the New World. There is that land in Virginia which King Charles gave our ancestor. Frank will give us that."

"Hush, boy," she replied. "For you the world is just beginning; for me, I must leave it and pray out my expiation, dear. But when your heart is wounded come to me, Henry."

When they reached the house, a new sensation was in store for Esmond.

HOW THE BEAUTY OF BEATRIX BEWITCHED HER COUSIN HARRY

Down the wide stairs of the old hall came the lovely figure of a bewitching young woman, carrying a candle in her hand, which lighted up the prettiest white neck in the world, and shone upon the scarlet ribbon she had donned on hearing that Captain Esmond was coming to dinner. This was Beatrix, whom he had left a girl and found a woman.

All the roses of spring could not vie with the brightness of her complexion. Esmond thought he had never seen anything like the sunny lustre of her eyes. She was a brown beauty—that is, her eyes, hair, and eyebrows and eyelashes were dark, her hair curling

with rich undulations and waving over her shoulders; but her complexion was as dazzling white as snow in sunshine. She approached, shining smiles upon Esmond, who could look at nothing but her eyes. She advanced, holding forward her head, as if she would have him kiss her as he used to do when she was a child.

WHY CAPTAIN ESMOND WENT OFF AGAIN TO THE WARS IN GERMANY

"Stop!" she said. "I am grown too big! Welcome, Cousin Harry!" And after making him a sweeping curtsey, she gave him both her hands and said: "Oh, Harry, we are so glad you are come!"

With many a tale of how the bewitching Trix had certain of the great noblemen of the day at her feet, Frank, in his boyish way, entertained Esmond during his stay. If Esmond did not as yet realise that Beatrix was, with all her gentler charms, not a little vain and somewhat fickle-hearted, he could see that whoever was to marry her would have to possess both rank and wealth. Yet deeply though he loved and admired Lady Castlewood, who was just as much older than he as Trix was younger, he was not without thoughts of asserting his claim to the Castlewood title and estates when he found himself bewitched by Beatrix; so to escape from his conflicting emotions, he went off again to the wars in Germany.

On his return to England he found himself possessed of the small fortune and the valuable diamonds of the Lady Isabel, who had died in his absence. Beatrix he considered more beautiful than ever. She was now engaged to marry the Duke of Hamilton.

THE AMBITIONS OF MISTRESS BEATRIX AND A JACOBITE PLOT

That eminent nobleman was about to proceed to France with the hope of inducing the son of James II., known as the Pretender, to come to England and make an effort to regain the throne, as Queen Anne was then in failing health. Beatrix was deeply involved in the plot, and was radiantly happy as she thought of her future greatness.

"Go and marry mamma," she said to Esmond, who had now attained the rank of colonel. "Go and be Darby and Joan for the rest of your lives! That's what you two are fitted for! Oh, cousin, when will you learn that I have no heart?"

At a modest house in Kensington, near by the palace, Esmond found his dear Lady Castlewood, and there learned from her that she, too, had come into possession of the secret of his birth, revealed to her by the Lady Isabel just before she died. It had been considered better for the cause of the exiled king that the secret should have been kept while Henry's father was alive. "But now the decision is with you, Harry," she said.

"My decision was made beside the death-bed of my dear lord," said Colonel Esmond. "I am the head of the family, but your son is Viscount Castlewood still."

"Dear, generous Harry!" cried the lady, throwing herself at his feet. "Nay, do not raise me. Let me kneel and—and worship you."

The generosity of Esmond—to which he was prompted more by love for Lady Castlewood than out of consideration for her son, though he had ever loved the manly Frank as a younger brother—made happy his dear lady.

BEATRIX SUFFERS A GREAT LOSS AND ESMOND ENGAGES IN A NEW PLOT

But the tragic death of the Duke of Hamilton, who had fallen, like the late viscount, in a duel with Mohun, though not before fatally wounding the rascal, was a sad blow for Beatrix. She bore herself with great dignity in the face of her ruined hopes, and proved thereby, perhaps, the truth of what she had said to Esmond about her lack of heart.

Colonel Esmond himself now put in action a plan for bringing the Pretender, James Stuart, over to England, so that on the death of Queen Anne he might quietly be proclaimed as king. The young Viscount Castlewood, who had been serving with the army on the Rhine, was still in that district. In personal appearance he closely resembled the Pretender; and nothing was easier than that the son of James II. should travel disguised as Viscount Castlewood, while Frank accompanied him as his servant. So was it planned and carried out, the Pretender being brought to the modest house in Kensington, where the Esmonds and all the Jacobite leaders in the secret did homage to him as their rightful king.

MISTRESS BEATRIX KNIGHTING HENRY ESMOND

Esmond had been of service to young Lord Castlewood abroad, and returning to England while his kinsman remained abroad, Esmond found the ladies of the family overjoyed to have him with them. A reception was prepared for him; and Beatrix, in the presence of her mother and Lady Isabel, knighted him as in the days of old.

This picture is reproduced from the painting by A. L. Egg, R.A., now hanging in the National Gallery of British Art.

All were now filled with the greatest hopes for the success of their conspiracy, and the only one among them who did not seem to be in earnest was the feminine and pleasure-loving James Stuart himself. He was more eager to make love to Beatrix than to engage with his supporters in advancing their scheme.

So Beatrix was practically banished to Castlewood, and felt very bitter towards Esmond in consequence, blaming him chiefly for what she considered the indignity put upon her.

At almost any moment, the conspirators were hoping, the great hour might arrive when a new King James would be proclaimed by them, as the announcement of the queen's death was made. One day, when the queen was thought to be sinking rapidly, they discovered, to their amazement, that the Pretender had disappeared from the house in Kensington. At once they guessed that he had made his way to Castlewood, there to enjoy the company of the bewitching Trix.

Hastily getting to horse, Colonel Esmond and the young viscount spurred thither at breathless pace, and found they had guessed aright. Forcing themselves, no longer ceremoniously, into the presence of the young prince, Esmond upbraided him for his folly and the neglect of a great opportunity, saying that even now, it might be, the queen had died, and here was he writing foolish verses to a beautiful but light-headed girl. James Stuart treated the colonel at first with haughtiness, but Esmond was determined to brook no opposition in the course he had now decided upon; and he asked the Pretender to accompany him into the chaplain's room, where, from a little secret chamber over the mantelpiece, the colonel took some papers which had long been there concealed.

"Here, may it please your Majesty," said Colonel Esmond, "is the patent of marquis sent over by your Royal father at St. Germains to Viscount Castlewood, my father; here is the certificate

of my father's marriage to my mother, and of my birth and christening. I was christened of that religion of which your sainted sire gave all through life so shining an example. These are my titles, dear Frank"—turning to the astonished young viscount—"and this is what I do with them: here go baptism and marriage, and here the marquisate and the august sign-manual in which the late King James was pleased to honour our race."

COLONEL ESMOND BREAKS HIS SWORD BEFORE THE PRETENDER

So saying, Esmond set the papers burning in the brazier, and continued addressing the young prince.

"You will please, sir, to remember that our family hath ruined itself by fidelity to yours, that my grandfather spent his estate and gave his blood and his son to die in your service; that my dear lord's grandfather—for lord you are now, Frank, by right and title too—died for the same cause; and that my poor kinswoman, my father's second wife, sent all her wealth to the king, getting in return that precious title that lies in ashes and this inestimable yard of blue ribbon. I lay this at your feet and stamp upon it; I draw this sword and break it and deny you; and Frank will do the same, won't you, cousin?"

Frank, who had been looking on with a stupid air at the papers as they flamed in the old brazier, took out his sword and broke it, saying:

"I go with my cousin," giving Esmond his hand. "It's all your Majesty's own fault. The queen is dead most likely by this time, and you might have been king if you had not deserted your loyal friends in London."

HOW ANOTHER DUEL WAS INTERRUPTED BY MISTRESS BEATRIX

"Thus to lose a crown," said the young prince, starting up and speaking in his eager way, "and the loyalty of such hearts as these! I offer you the only reparation in my power. Will you favour me by crossing swords with me?"

James Stuart and Esmond had no sooner crossed swords than Frank stepped forward, and with the broken blade of his own knocked them up, just as Beatrix entered the room. A great change had come over her; her face had now assumed a look of deepest care, her cheeks were pale, her eyes glared.

"Will it please the king to breakfast before he goes?" was all she said; but, going up to Esmond, she hissed low a few words of bitterness in his ear. And, looking at her now, he wondered that he had ever thought of love for her.

When the king had reached London again, whither he was accompanied by Esmond and Castlewood, there was a great crowd outside Kensington Palace, and presently from the gates trumpeters and heralds came forth. The trumpets blew and the heralds proclaimed: "George, by the Grace of God, of Great Britain, France, and Ireland, King, Defender of the Faith." And the people shouted "God save the king!"

Thus King George's trumpeters blew all the hopes of the Pretender to the winds, and that unworthy prince was soon hurried back in secret to France.

After the failure of the Jacobite plot the young Viscount Castlewood went abroad, and there he married, somewhat foolishly, a German woman. When, soon after, Beatrix left her mother and her home to stay in France, Esmond one day found Lady Castlewood in tears, and besought that dear lady to confide herself to the care and devotion of one who would never forsake her.

COLONEL ESMOND AND LADY CASTLEWOOD BEGIN A NEW LIFE IN VIRGINIA

So it came about that this true hero and this gentlest of women joined hands as husband and wife; and Frank giving them the American property of the family in Virginia, thither they went and founded a new Castlewood.

"In our trans-Atlantic country," to quote the words of Esmond himself, "we have a season, the calmest and most delightful of the year, which we call the Indian summer; I often say the autumn of our life resembles that happy and serene weather, and am thankful for its rest and sweet sunshine. Heaven hath blessed us with a child, which each parent loves for her resemblance to the other. Our diamonds are turned into ploughs and axes for our plantations, and into negroes, the happiest and merriest, I think, in all this country; and the only jewel by which my wife sets any store, and from which she hath never parted, is that gold button she took from my arm on the day when she visited me in prison."

The next Famous Books are on page 3363.

A BALLAD BY A GREAT AMERICAN POET

JOHN GREENLEAF WHITTIER, one of the foremost poets of America, was born on December 17, 1807, and died September 7, 1892. He took a prominent part in the long fight for the liberation of the slaves in our land, and all his writings breathe a steady devotion to the cause of liberty and righteousness. One of his ballads has been chosen here as an example of his sweet and tender poetry. It is a simple story of what is happening every day, and there are many to whom the words "It might have been" have all the sad meaning they had for Maud Müller and the Judge.

MAUD MÜLLER: A TALE IN VERSE

CONTINUED FROM 3128

MAUD MÜLLER, on a summer's day,
Raked the meadow sweet with hay.

Beneath her torn hat glowed the wealth
Of simple beauty and rustic health.

Singing, she wrought, and her merry glee
The mock-bird echoed from his tree.

But when she glanced to the far-off town,
White from its hill-slope looking down,

The sweet song died, and a vague unrest
And a nameless longing filled her breast—

A wish, that she hardly dared to own,
For something better than she had known.

The Judge rode slowly down the lane,
Smoothing his horse's chestnut mane.

He drew his bridle in the shade
Of the apple-trees, to greet the maid,

And asked a draught from the spring that flowed
Through the meadows across the road.

She stooped where the cool spring bubbled up,
And filled for him her small tin cup,

And blushed as she gave it, looking down
On her feet so bare, and her tattered gown.

"Thanks!" said the Judge, "a sweeter draught
From a fairer hand was never quaffed."

He spoke of the grass, and flowers and trees,
Of the singing birds and the humming bees;

Then talked of the haying, and wondered whether [weather.
The cloud in the west would bring foul

And Maud forgot her briar-torn gown,
Her graceful ankles bare and brown,

And listened, while a pleased surprise
Looked from her long-lashed hazel eyes.

At last, like one who for delay
Seeks a vain excuse, he rode away.

Maud Müller looked and sighed, "Ah, me!
That I the Judge's bride might be!

"He would dress me up in silks so fine,
And praise and toast me at his wine.

"My father should wear a broadcloth coat,
My brother should sail a painted boat.

"I'd dress my mother so grand and gay,
And the baby should have a new toy each day.

"And I'd feed the hungry, and clothe the poor,
And all should bless me who left our door."

The Judge looked back as he climbed the hill,
And saw Maud Müller standing still.

"A form more fair, a face more sweet,
Ne'er hath it been my lot to meet.

"And her modest answer and graceful air
Show her wise and good as she is fair.

"Would she were mine, and I to-day,
Like her, a harvester of hay:

"No doubtful balance of rights and wrongs
And weary lawyers with endless tongues.

"But low of cattle and song of birds,
And health of quiet and loving words."

But he thought of his sisters, proud and cold,
And his mother, vain of her rank and gold.

So, closing his heart, the Judge rode on,
And Maud was left in the field alone.

But the lawyers smiled that afternoon,
When he hummed in court an old love tune;

And the young girl mused beside the well,
Till the rain on the unraked clover fell.

He wedded a wife of richest dower,
Who lived for fashion as he for power.

Yet oft in his marble hearth's bright glow
He watched a picture come and go.

And sweet Maud Müller's hazel eyes
Looked out in their innocent surprise.

Oft when the wine in his glass was red,
He longed for the wayside well instead;

And closed his eyes on his garnished rooms,
To dream of meadows and clover blooms.

And the proud man sighed with a secret pain
"Ah, that I were free again!

"Free as when I rode that day,
Where the barefoot maiden raked her hay."

She wedded a man unlearned and poor,
And many children played round her door.

But care and sorrow and child-birth pain
Left their traces on heart and brain,

And oft when the summer sun shone hot
On the new-mown hay in the meadow lot,

And she heard the little spring-brook fall
Over the roadside, through the wall,

In the shade of the apple-tree again
She saw a rider draw his rein ;

And, gazing down with timid grace,
She felt his pleased eyes read her face.

Sometimes her narrow kitchen walls
Stretched away into stately halls,

The weary wheel to a spinet turned,
The tallow candle an astral burned,

And for him who sat by the chimney lug,
Dozing and grumbling o'er pipe and mug,

A manly form at her side she saw,
And joy was duty, and love was law;

Then she took up her burden of life again,
Saying only, " It might have been ! "

Alas ! for maiden, alas ! for Judge,
For rich repiner and household drudge !

God pity them both, and pity us all,
Who vainly the dreams of youth recall,

For of all sad words of tongue or pen,
The saddest are these : " It might have been!"

Ah, well ! for us some sweet hope lies
Deeply buried from human eyes ;

And, in the hereafter, angels may
Roll the stone from its grave away !

A LAUGHING SONG

We have already had the pleasure of reading several of William Blake's Nature songs in our "Book of Poetry." Many of his short poems, such as that given here, might be described as songs of "the joy of the earth," borrowing a phrase from another poet. The idea of Nature being glad is, of course, as ancient as thought; and we find such phrases in the Bible as "Let the hills be joyful" and "The trees of the field shall clap their hands."

When the green woods laugh with the voice of joy,
And the dimpling stream runs laughing by ;
When the air does laugh with our merry wit,
And the green hill laughs with the noise of it ;

When the meadows laugh with lively green,
And the grasshopper laughs in the merry scene ;
When Mary, and Susan, and Emily,
With their sweet round mouths sing, " Ha, ha, he ! "

When the painted birds laugh in the shade,
Where our table with cherries and nuts is spread :
Come live, and be merry, and join with me
To sing the sweet chorus of " Ha, ha, he ! "

POOR DOG TRAY

This has long been a favourite poem. Its simple pathos and just sentiment give it enduring life. It was written by Thomas Campbell, many of whose poems have appeared in these pages, and is properly entitled "The Harper," but it is more familiar under the title we have given it here.

On the green banks of Shannon, when Sheelah was nigh,
No blithe Irish lad was so happy as I ;
No harp like my own could so cheerily play,
And wherever I went was my poor dog Tray.

When at last I was forced from my Sheelah to part,
She said (while the sorrow was big at her heart) :
"Oh ! remember your Sheelah when far, far away,
And be kind, my dear Pat, to our poor dog Tray."

Poor dog ! he was faithful and kind to be sure,
And he constantly loved me although I was poor ;
When the sour-looking folk sent me heartless away,
I had always a friend in my poor dog Tray.

When the road was so dark, and the night was so cold,
And Pat and his dog were grown weary and old,
How snugly we slept in my old coat of grey,
And he lick'd me for kindness—my old dog Tray.

Though my wallet was scant I remember'd his case,
Nor refused my last crust to his pitiful face ;
But he died at my feet on a cold winter day,
And I play'd a sad lament for my poor dog Tray.

Where now shall I go, poor, forsaken, and blind ?
Can I find one to guide me, so faithful and kind ?
To my sweet native village, so far, far away,
I can never more return with my poor dog Tray.

THE PRIEST AND THE MULBERRY TREE

Thomas Love Peacock, born October 18, 1785, and died January 23, 1866, wrote a number of remarkable stories, full of wit and satire, and sprinkled with many charming poems. His novels are little read to-day, and only here and there do we find his poems quoted. The following is from his pen, and although the lesson it conveys is one that is very obvious, it is presented with a real touch of sly humour.

Did you hear of the curate who mounted his mare,
And merrily trotted along to the fair ?
Of creature more tractable none ever heard :
In the height of her speed she would stop at a word ; Hey !
But again with a word, when the curate said
She put forth her mettle and gallop'd away.

As near to the gates of the city he rode,
While the sun of September all brilliantly glow'd,
The good priest discover'd, with eyes of desire,
A mulberry-tree in a hedge of wild briar :
On boughs long and lofty, in many a green shoot,
Hung large, black, and glossy, the beautiful fruit.

The curate was hungry and thirsty to boot ;
He shrunk from the thorns, though he long'd for the fruit ;
With a word he arrested his courser's keen speed,
And he stood up erect on the back of his steed ;
On the saddle he stood while the creature stood still,
And he gather'd the fruit till he took his good fill.

" Sure never," he thought, " was a creature so rare,
So docile, so true, as my excellent mare ;
Lo, here now I stand," and he gazed all around,
" As safe and as steady as if on the ground ;
Yet how had it been, if some traveller this way,
Had, dreaming no mischief, but chanced to cry Hey ? "

He stood with his head in the mulberry-tree,
And he spoke out aloud in his fond reverie ;
At the sound of the word the good mare made a push
And down went the priest in the wild-briar bush.
He remembered too late, on his thorny green bed,
Much may well may be thought cannot wisely be said.

THE BELLS. By Edgar Allan Poe

Edgar Allan Poe is one of the most remarkable poets America has produced, and, with the exception of Walt Whitman, the most individual genius in American poetry. He was born in Boston, Massachusetts, on January 19, 1809, and died in Baltimore, on October 17, 1849, after an unsettled and disastrous life. No modern poet or writer of fiction has excelled him in weird and "uncanny" imaginings. He is also a great master of word melody. In the following famous poem, which has long been popular as a recitation by reason of its dramatic force, one can see how the verse steadily increases in its measure of music and changes in character from the jingling of the light sledge-bells to the far-resounding noise of the great city bells ringing in the still night.

I.

HEAR the sledges with the bells—
Silver bells!
What a world of merriment their melody foretells!
How they tinkle, tinkle, tinkle,
In the icy air of night!
While the stars that oversprinkle
All the heavens seem to twinkle
With a crystalline delight;
Keeping time, time, time,
In a sort of Runic rhyme,
To the tintinnabulation that so musically swells
From the bells, bells, bells, bells
Bells, bells, bells—
From the jingling and the tinkling of the bells.

II.

Hear the mellow wedding bells,
Golden bells!
What a world of happiness their harmony foretells!
Through the balmy air of night
How they ring out their delight!—
From the molten golden notes,
And all in tune,
What a liquid ditty floats
To the turtle-dove that listens, while she gloats
On the moon!
Oh, from out the sounding cells,
What a gush of euphony voluminously wells!
How it swells,
How it dwells
On the Future; how it tells
Of the rapture that impels
To the swinging and the ringing
Of the bells, bells, bells,
Of the bells, bells, bells, bells,
Bells, bells, bells—
To the rhyming and the chiming of the bells!

III.

Hear the loud alarum bells—
Brazen bells!
What a tale of terror now, their turbulency tells;
In the startled air of night
How they scream out their affright!
Too much horrified to speak,
They can only shriek, shriek,
Out of tune,
In the clamorous appealing to the mercy of the fire,
In the mad expostulation with the deaf and frantic fire.
Leaping higher, higher, higher,
With a desperate desire,
And a resolute endeavour
Now—now to sit or never,
By the side of the pale-faced moon.
Oh, the bells, bells, bells!
What a tale their tenor tells
Of Despair!
How they clang and crash and roar!
What a horror they outpour
On the bosom of the palpitating air!
Yet the air it fully knows,
By the twanging,
And the clanging,
How the danger ebbs and flows;
Yet the air distinctly tells,
In the jangling,
And the wrangling,
How the danger sinks and swells,
By the sinking or the swelling in the anger of the bells—
Of the bells—
Of the bells, bells, bells, bells,
Bells, bells, bells—
In the clamour and the clangour of the bells!

IV.

Hear the tolling of the bells—
Iron bells!
What a world of solemn thought their melody compels!
In the silence of the night,
How we shiver with affright
At the melancholy menace of their tone;
For every sound that floats
From the rust within their throats
Is a groan.
And the people—ah, the people—
They that dwell up in the steeple,
All alone,
And who tolling, tolling, tolling,
In that muffled monotone,
Feel a glory in the rolling
On the human heart a stone—
They are neither man nor woman—
They are neither brute nor human,
They are Ghouls:
And their king it is who tolls;
And he rolls, rolls, rolls,
Rolls
A pæan from the bells!
And his merry bosom swells
With the pæan from the bells!
And he dances and he yells;
Keeping time, time, time,
In a sort of Runic rhyme,
To the throbbing of the bells—
Of the bells, bells, bells—
To the sobbing of the bells;
Keeping time, time, time,
As he knells, knells, knells,
In a happy Runic rhyme,
To the rolling of the bells—
Of the bells, bells, bells—
To the tolling of the bells,
Of the bells, bells, bells, bells—
Bells, bells, bells—
To the moaning and the groaning of the bells.

SAY NOT THE STRUGGLE NAUGHT AVAILETH

Arthur Hugh Clough is one of the most noteworthy among the lesser poets of England. Born at Liverpool on New Year's Day, 1819, he died at Florence, November 13, 1861. His poetry is not only beautiful in form but is weighted with thought, and these four short verses make up a little gem of poetic form and enlarging thought. They are a warning to us not to take a narrow view of life.

SAY not the struggle naught availeth,
The labour and the wounds are vain;
The enemy faints not, nor faileth,
And as things have been they remain.

If hopes were dupes, fears may be liars;
It may be, in yon smoke concealed,
Your comrades chase e'en now the fliers,
And, but for you, possess the field.

For while the tired waves, vainly breaking,
Seem here no painful inch to gain,
Far back, through creeks and inlets making,
Comes silent, flooding in, the main.

And not by eastern windows only,
When daylight comes, comes in the light;
In front the sun climbs slow, how slowly!
But westward, look, the land is bright!

THE INDUSTRY OF ANIMALS

We here give another of the poems of Thomas Miller, the poor basket-maker who became a poet and author of some note and whose writings are always of a pure and elevating character.

THE lute-voice birds rise with the light,
Their nestling young to feed,
Pursue the insects in their flight,
Or pluck the feathery seed.

The golden-belted humming-bee
Goes toiling hour by hour,
Over the moor and distant lea,
Wherever grows a flower.

With weary journeys up and down,
He home his honey brings,
From gardens in the distant town,
And while he labours sings.

The long-tailed field-mouse to the wood
Makes journeys many a score,
And in a granary piles his food,
And hoards his wintry store.

Within the hollow of a tree
The nimble squirrel hides
His meat and nuts right cunningly,
And for the cold provides.

His home the mole makes underground,
With runs and chambers crossed
And galleries circling round and round,
In which you would be lost.

Although the swallow in her nest
Displays such art and skill,
She has no tools save her white breast,
And small sharp-pointed bill.

There's not an insect crawls or flies
But what has work to do,
And the same God their wants supplies
Who watcheth over you.

No single thing did God create
But He for it gave food,
And whether it be small or great,
"He saw that it was good."

AULD LANG SYNE

There is probably no song in any language that has ever attained such a world-wide and enduring popularity as this famous song, partly, if not entirely, written by Robert Burns. Like most of his popular songs these words were composed for an old tune, though not for the tune to which it is usually sung, that being also an old Scots melody. It is the homely and human sentiment of the song that has won for it universal favour, even among people who are only dimly conscious of the real meaning of the old Scots words. There are many words in it that require explanation, but we need only say that it is a song in praise of friendship and "old time's sake" between friends who, we fear, are supposed to have a taste for drinking.

SHOULD auld acquaintance be forgot,
And never brought to mind?
Should auld acquaintance be forgot,
And auld lang syne?

For auld lang syne, my jo,
For auld lang syne,
We'll tak' a cup o' kindness yet,
For auld lang syne.

And surely ye'll be your pint-stoup,
And surely I'll be mine;
And we'll tak' a cup o' kindness yet,
For auld lang syne.

We twa hae run about the braes,
And pu'd the gowans fine;
But we've wander'd mony a weary fit
Sin' auld lang syne.

We twa hae paidled i' the burn
Frae morning sun till dine;
But seas between us braid hae roar'd
Sin' auld lang syne.

And there's a hand, my trusty fiere,
And gie's a hand o' thine;
And we'll tak' a right gude-willie waught,
For auld lang syne.

LITTLE WHITE LILY

Dr. George Macdonald contrives in these pretty little verses to state a simple fact from the life of the flowers in language that is at once child-like and yet perfectly expressive It would be a good thing if some grown-up people who are fond of using needlessly long words, in the hope of appearing wise, would learn from this poem how much can be said in words that a child uses every day.

LITTLE white Lily
Sat by a stone,
Drooping and waiting
Till the sun shone.
Little white Lily
Sunshine has fed;
Little white Lily
Is lifting her head.

Little white Lily
Said: "It is good;
Little white Lily's
Clothing and food."
Little white Lily,
Drest like a bride!
Shining with whiteness,
And crown'd beside!

Little white Lily
Droopeth with pain,
Waiting and waiting
For the wet rain.
Little white Lily
Holdeth her cup;
Rain is fast falling
And filling it up.

Little white Lily
Said: "Good again,
When I am thirsty
To have nice rain;
Now I am stronger,
Now I am cool;
Heat cannot burn me,
My veins are so full."

Little white Lily
Smells very sweet:
On her head sunshine,
Rain at her feet.
"Thanks to the sunshine,
Thanks to the rain!"
Little white Lily
Is happy again!

LITTLE VERSES FOR VERY LITTLE PEOPLE

A LITTLE old man and I fell out ;
How shall we bring this matter about ?
Bring it about as well as you can ;
Get you gone, you little old man.

THERE'S a neat little clock,
In the schoolroom it stands,
And it points to the time
With its two little hands.
And may we, like the clock,
Keep a face clean and bright,
With hands ever ready
To do what is right

As I was going up Pippen Hill,
Pippen Hill was dirty ;
There I met a pretty miss,
And she dropped me a curtsey.
Little miss, pretty miss,
Blessings light upon you !
If I had half a crown a day,
I'd spend it all upon you.

THEY that wash on Friday, wash in need ;
And they that wash on Saturday, oh ! they're sluts indeed.

M. N. O.

Words by ALFRED P. GRAVES. Music by permission of MESSRS. SCHOTT & Co.

Naively.

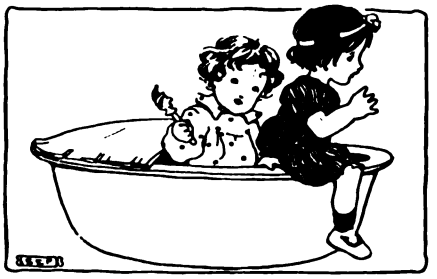
1. M. N. O. Our Pus - sy's in the snow ! When she comes back the way she's gone, She'll have such queer white stock - ings on. O
2. A. B. C. Our Pus - sy's up the tree ! And now be - gins with sneeze and cough To lick her long white stock - ings off. No

f

Je - re - my, O Je - re - my, O Jo, O Jo, O Jo !
more she'll go in - to the snow ; Not she, not she, not she !

f

BLESS you, bless you, bonnie bee!
Say, when will my wedding be?
If it be to-morrow day,
Take your wings and fly away.
Fly away east, or fly away west,
And show me where *he* lives who loves me the best!



BABY and I
Were baked in a pie,
The gravy was wonderful hot!
We had nothing to pay
To the baker that day,
And so we crept out of the pot.

"How many miles to Babylon?"
"Three score miles and ten."
"Can I get there by candle-light?"
"Yes, and back again;
If your heels are nimble and light
You may get there by candle-light."

BRIAN O'LIN had no breeches to wear,
So he bought him a sheepskin and made him a pair,
With the skinny side out, and the woolly side in,
"Ah, ha, that is warm!" said Brian O'Lin.

Brian O'Lin and his wife and wife's mother,
They all went over a bridge together;
The bridge was broken and they all fell in,
"Mischief take all!" quoth Brian O'Lin.

UP hill and down dale;
Butter is made in every vale;
And if that Nancy Cook
Is a very good girl,
She shall have a spouse,
And make butter anon,
Before her old grandmother
Grows a young man.

WASH me and comb me,
And lay me down softly,
And lay me on a bank to dry,
That I may look pretty,
When somebody comes by.

"OLD woman, old woman, shall we go a-shearing?"
"Speak a little louder, sir, I'm very thick of hearing."
"Old woman, old woman, shall I kiss you dearly?"
"Thank you, kind sir, I hear you very clearly."

"LITTLE maid, pretty maid, whither goest thou?"
"Down in the forest to milk my cow."
"Shall I go with thee?" "No, not now;
When I send for thee, then come thou."

SLEEP, baby, sleep,
Our cottage vale is deep;
The little lamb is on the green,
With woolly fleece so soft and clean--
Sleep, baby, sleep!

Sleep, baby, sleep,
Down where the woodbines creep;
Be always like the lamb so mild,
A kind, and sweet, and gentle child—
Sleep, baby, sleep!

DRIBBLE, dribble, trickle, trickle,
What a lot of rawdust!
My dolly's had an accident,
And has lost a lot of sawdust!

THE cuckoo's a bonny bird,
She sings as she flies;
She brings us good tidings,
And tells us no lies.
She sucks little birds' eggs,
To make her voice clear,
And never cries Cuckoo
Till spring-time of the year.

RHYMES AND JINGLES OF MARY MAPES DODGE

We have already had the pleasure of reading in the CHILD'S BOOK OF POETRY several of the pretty little poems specially written for young folk by the late Mary Mapes Dodge, a charming woman who used to edit the famous children's magazine called St. Nicholas. On this page and the next we have gathered together a collection of her little verses, which are rather nursery rhymes than poems. They have been reprinted, by permission of Messrs. Charles Scribner's Sons, from Miss Dodge's book entitled Rhymes and Jingles.

BILLY BOY

Poor Billy boy was music mad,
On music mad was he;
And yet he was as blithe a lad
As any lad could be.
With a "hi-de-diddle,
Bow and fiddle,
Rig-a-my, ho!" sang he—
For Billy was as blithe a lad
As any lad could be.

"Nobody knows the joys I know,
Or sees the sights I see;
So play me high, or play me low,
My fiddle's enough for me.
It takes me here, it takes me there—
So play me low or high—
It finds me, binds me anywhere,
And lifts me to the sky."
With a "hi-de-diddle,
Bow and fiddle,
Rig-a-my, ho!" sang he—
For Billy was as blithe a lad
As any lad could be.

THE GOOD LITTLE GIRLS

Oh, where are all the good little girls?
Where are they all to-day?
And where are all the good little boys?
Tell me, somebody, pray.

Safe in their father's and mother's hearts,
The girls are stowed away;
And where the girls are, look for the boys—
Or so I've heard folk say.

LITTLE WHITE FEATHERS

Little white feathers,
Filling the air—
Little white feathers,
How came ye there?
"We came from the cloud-birds
Sailing so high;
They're shaking their white wings
Up in the sky."

Little white feathers,
How swift you go!
Little white snowflakes,
I love you so!
"We are swift because
We have work to do;
But hold up your face,
And we'll kiss you true."

ONE AND ONE

Two little girls are better than one;
Two little boys can double the fun;
Two little birds can build a fine nest;
Two little arms can love mother best;
Two little ponies must go to a span;
Two little pockets has my little man;
Two little eyes to open and close,
Two little ears and one little nose,
Two little elbows, dimpled and sweet,
Two little shoes on two little feet,
Two little lips and one little chin,
Two little cheeks with a rose shut in,
Two little shoulders, chubby and strong,
Two little legs running all day long.
Two little prayers does my darling say,
Twice does he kneel by my side each day,
Two little folded hands, soft and brown,
Two little eyelids cast meekly down,
And two little angels guard him in bed,
One at the foot, and one at the head.

THE THREE OLD LADIES

There was an old lady all dressed in silk,
Who lived upon lemons and buttermilk;
And, thinking this world was a sour old place,
She carried its acid all over her face.

Another old lady, all dressed in patches,
Lived upon nothing but lucifer matches;
So the world, it made her strangle and cough,
And sure as you rubbed her you set her off.

Another old lady, all sunny and neat,
Who lived upon sugar, and everything sweet,
Exclaimed, when she heard of their troubles, "I never!
For the world is so nice I could live on for ever!"

Now, children, take your choice
Of the foods your heart shall eat;
There are sourish thoughts, and brimstone thoughts,
And thoughts all good and sweet.

And whatever the heart feeds on,
Dear children, trust to me,
Is precisely what this queer old world
Will seem to you to be.

A LITTLE VEGETABLE GARDEN

WHAT TO DO IN THE MIDDLE OF MAY

ONE of the important mid-May operations is weeding. Weeds grow apace at this season, and we have to remember that they are taking the goodness from the soil that our vegetable plants should receive. Our bed of onions must have special attention, and this we must certainly *hand* weed, as it will not be safe to use even a small hoe among our little plants. In fact, it will be a good rule to hand weed entirely among all our young and growing crops.

We may still sow lettuces, cress, and radishes to yield a supply when those already growing are finished. And let us always bear in mind that sowing should be done on ground that has been deeply dug, and then allowed a little while in which to settle; and we may even sow another row of peas if we have not sufficient already in the various stages of growth. It is very important to put sticks to our peas, and later on to our runner beans, directly they need support. They soon feel the need of something round which to grow. But we set up our pea-sticks, and still, perhaps, find that not quite every plant is able to reach them. In this case let us take some short twigs and branches, and place them close beside the little plants to help them until they find their way to the larger sticks. These are small matters, but they all help towards success.

In some places young gardeners will find themselves greatly troubled with slugs. These greedy insects may be dealt with by putting ridges of soot, or soot and lime, round the plants. Night is their feeding time, and many people find one of the most successful ways of catching them is to go out with a lantern about ten o'clock and pick them off their young plants and the soil, and destroy them. Another remedy is to cut slices of turnips or potatoes and place them on the soil. When they are lifted, numbers of slugs will probably be found on the under sides of them.

But after all our best friends in the matter of slugs and other insects are the toads; therefore, instead of killing them, we should do everything to encourage them.

If we sowed our string beans quite early they are perhaps at this moment our most forward crop. We should have thinned them, if necessary, before this, and must now keep a look-out for the tiny black aphis — an insect which infests the leaves; pick off these leaves and destroy them.

The squash and pumpkins are interesting to grow, different in character from most other things in our gardens. But it is a tender plant, and if we are waiting to sow the seed out of doors it had better not be done until the third week of the month, and then only if the weather is favourable. In many gardens these succeed better if raised above the level than if grown on the surface; we therefore make a mound with stable manure and leaves, and several inches of soil, and on this sow our seed. When the seedlings are through the soil, it will be a good thing to put empty pots over them for the night, as a slight protection for a little while. And we may give the same treatment to ridge cucumbers, if we choose to grow them.

For planting out our little cabbage plants, Brussels sprouts, and others as they become forward enough, it is well to choose showery weather, as this is helpful to growth. The time for this operation will depend upon the size of the plants. If it is a very dry time we may water the soil, and the next day plant them out, and then give them a watering in their new quarters. Young gardeners may be inclined to use the watering-can too freely. This is a mistake, for it means sour, saturated soil. We should water only when the surface is really dry. We may even scrape the soil away and examine it an inch or two below the surface, and if we find it moist we need not water that day.

Perhaps we have two or three gooseberry bushes in our little garden plots, and have decided that some of the fruit shall be picked unripe for tarts, leaving the rest to ripen. The unripe fruit should be picked from those trees which are in shady positions, as they will never become so sweet or so good as those in the full sunshine.

The present season is a good time to sow the seed for next year's wallflowers.

The best way is to sow in some little spare patch among the vegetables, and afterwards to transplant the little seedlings farther apart, and then in the autumn to put them in the positions in which they are to flower. It is very useful to use our vegetable garden in this way for seedling plants of flowering subjects that are not due to flower until next year, and if we like we may sow the seed now of forget-me-nots, sweet williams, canterbury bells, honesty, and of many other plants.

We must be careful to hunt for insects—grubs, caterpillars, and green-flies—on our rose leaves. Those rose-trees which we pruned so carefully at the end of March or early in April will by this time have grown a good deal. If we find a leaf curled round, or apparently fastened down one side over the other, and examine it, we shall find there a grub, which will in time become a young caterpillar, ready to eat the rose leaves and often destroy buds. There is nothing but hand picking to get rid of this pest. The little green-fly may also become troublesome, and here also we shall find that the fingers are as useful as anything to clear it away. We may water the rose-trees, and occasionally give them manure water, mixed with clear water and soot water.

Our annual plants need careful attention and should be trimmed as severely as the little vegetables. Poppies will not bear transplanting, but most of the others can be used in different positions if the roots are not injured as we lift them.

THE NEXT THINGS TO MAKE AND THINGS TO DO BEGIN ON PAGE 3387

THE DANCE CALLED LAUDNUM BUNCHES

LAUDNUM BUNCHES is a corner dance, and many of the movements are typical of other dances. The dancers wave a handkerchief in each hand, holding it in one corner between the thumb and fingers, and wave it from the wrist with the arm upraised, as shown in picture 2. Some dancers secure it by twisting it round the finger. Laudnum Bunches seems a strange name for a dance. "Laudnum" is possibly a contraction of laudanum, a sweet-smelling gum, which used to be prepared from the leaves of a shrub and was utilised in making a perfumed powder. If this is so, the connection of a scented powder with handkerchiefs is accounted for.

The six dancers stand in two files and jump. Then the two files advance, so that the last couple are in the same spot as that where the first couple were before. Handkerchiefs are flung up while dancing at the fourth count of the step. The couples then retire and turn to dance facing the other way. The music is in six-eight time for these different movements, and just as the dancers get back to their original position they jump in half turning so as to face each other again.

With the change of music the movement called Corners starts. This reminds one of the familiar Sir Roger de Coverley dance.

The dancers stand facing each other, and Nos. 1 and 6 advance to pass each other and change corners, dancing the Morris step, and tossing up handkerchiefs, as shown in picture 2. Then turning about they face one another, and again approach as before, but only to the centre, and then retire to the

2. Tossing up handkerchiefs in the Corners figure

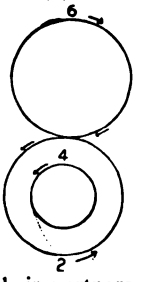
same corners, waving their handkerchiefs round their heads, and finally take a jump.

Next, Nos. 2 and 5 do exactly the same as the first couple. Then Nos. 3 and 4 do just the same as the other two couples. All the dancers are now in opposite places.

The music then alters to the original tune, and the dancers stand in file ready to start the Chain, which is practically a figure 8, and is a movement which is quite unlike the chain in the Lancers, where the dancers join hands,

3. The Back-to-Back movement in Laudnum Bunches

Nos. 1, 3, and 5 forming an S, and Nos. 2, 4, and 6 doing likewise. This is shown by a diagram of the movements of Nos. 2, 4, and 6.



The path of No. 4 is shown inside the path of No. 2 for the sake of clearness, but when No. 4 comes to the starting-place of No. 2 she begins following in the path of that dancer. Likewise No. 6 follows the path of No. 4 part of the way. At the middle of the chain the partners jump round to face each other again. The movements are reversed to finish the chain. Nos. 1, 3, and 5 dance the chain in the same way as their partners.

Next, the Corners are repeated. Following that is Crossing over as in Bean Setting.

The next part of Laudnum Bunches shows the "high" step. Partners stand facing each other, and Nos. 1 and 6 start the Capers. They advance towards each other, handkerchiefs flung up as in Corners, jump in the centre, then pass on to each other's corners, hopping alternately on left and right feet, and keeping knees stiff and feet high. Then they turn round to face and advance half-way. The time changes, and they retire, waving the handkerchiefs round the head and dancing the same step as in Corners. Then they jump. The other couples do likewise.

The Back-to-Back movement is like that in Bean Setting. It is shown in picture 3, where the couples are dancing back to back round their partners. The repetition of Capers brings partners into their right corners again.

At the signal "All in," when the last couple is finishing, the dancers close in towards the centre, and as the music ends, toss up their handkerchiefs and make the "call."

THE DANCE CALLED BEAN SETTING

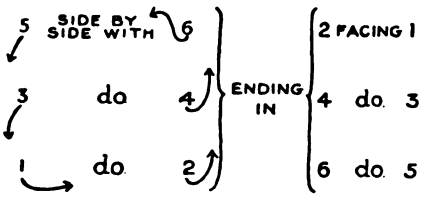
THE dance Bean Setting is so called because it illustrates the planting of beans in spring, and thus joyously celebrates the hopeful seed sowing. Six dancers stand in two-file form, each with a short stick in the right hand, held like a pencil, as shown in picture 1, and crossed with the partner's stick. The partners face each other. The sticks

1. Tapping sticks in the Ring figure in Bean Setting

replace the swords used in the ancient dance. The music of this dance starts with twelve-sixteen time, and the sticks are tapped on the ground or crossed in time with it. The dancers in their movements cover a space of about twelve feet each way.

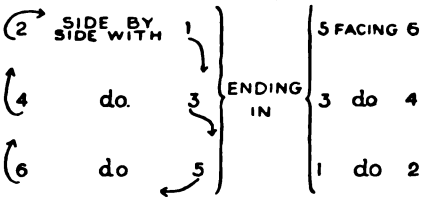
Dancer No. 1 is the leader, who calls out the figure or movement and makes known to his five comrades the end of the dance by the call "All in."

The first figure, named the Ring, starts by partners tapping sticks as shown in picture 1; then all the dancers form a ring, Nos. 3 and 4 moving a little out from their places, and then the whole six dancing in step to form half the ring. They then tap partners' sticks and circle the other way. In the picture which we see on the top of page 2765, they are shown dancing this Ring figure. The change which then takes place to jump into the position facing the music in two files is shown by the following diagram:



The arrows show how the ring is made, and the column on the right hand shows the new positions that are taken by the dancers.

In the second half the ring starts forming again, but when the dancers step out they do so in the reverse direction, as shown here:



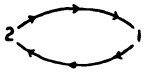
It must be noticed that when the dancers arrive in position facing each other, half-way through and also at the end, they make a half-turn jump into the file position again. and tap sticks across.

The next figure, Dibbing, imitates making holes for the setting or planting of beans. The music changes, and the partners face each other in two lines, holding the sticks in their right hands pointed down, and stooping forward. The stick is dibbed, or struck twice on the ground. The dancers stoop, and partners cross their sticks and tap them, letting the sticks remain crossed as seen in picture 1.

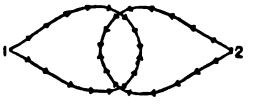
Dancers then tap their partners' sticks again, but instead of letting the sticks remain crossed, No. 1 taps No. 3, No. 3 taps No. 5, No. 5 taps No. 6. With the change of music No. 6 taps No. 4, No. 4 taps No 2, and this tapping all round ends by partners tapping and crossing sticks. Sometimes the Chain as described in Laudnum Bunches is danced here to lengthen the dance, which, though it seems lengthy, is very quickly performed.

The name of the next figure, Crossing-over, indicates the movement. Partners face, cross over and take each other's place, dancing the Morris step. For instance, Nos. 1 and 2 dance to opposite places, keeping each other on the right, and end by turning and facing each other, as shown in this diagram. Then all the couples dance in step round to the right in order that partners may get into the original position, facing each other again, and tap across. Nos. 1 and 2, for instance, then dance like this:

Dibbing is now repeated.



In the Back-to-Back movement partners advance and pass each other with right shoulders opposed, turn to the right half-way round each other back to back, and, with left shoulders opposed, retire into position backward. Nos. 1 and 2 move like this:



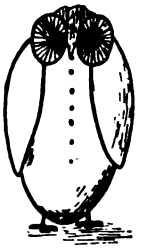
Tapping partners follows with the change of music. The movement of advancing and retiring is repeated, but partners dance forwards to the right of each other, opposing left shoulders in advancing, right on retiring.

Dibbing is repeated for the second time. Crossing-over is sometimes repeated here, and is followed by Dibbing again. At the call "All in," and as the music ends, the dancers form in two files with their sticks crossed.

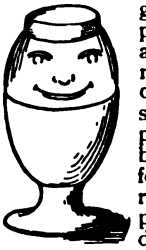
HOW TO MAKE OUR OWN EASTER EGGS

THE Easter egg is a beautiful idea. It is a symbol of the return of spring, for the egg contains in it, in a mysterious way, the promise of life. All over the world friends give and take presents of Easter eggs; in the country, perhaps, a basketful of the freshest new-laid eggs; but in town some of us may receive a pretty nest, or fancy basket, of sweatmeat eggs. Let us see if we can make some Easter eggs ourselves.

We might weave a little basket, or doll's hamper, as described on page 2131. In that we might put strips of torn white or pink tissue-paper. The eggs to go in the little hamper are real ones, well washed, and then, to make them firm, boiled for about ten minutes in a saucepan of water, coloured in some way. A few drops of cochineal will turn the water red and colour the eggs. Spinach water will turn them green; water in which onions or gorse-flowers were boiled, yellow. We can get mauve by boiling violet-blossoms; blue by using washing-blue. The water and eggs are taken out of the saucepan, and the eggs left in the water five minutes longer. The eggs, when coloured, are carefully dried and rubbed over with a cloth dipped in sweet oil, and placed on a dish to dry. We then pack them in the hamper, and direct it with a message on a card.

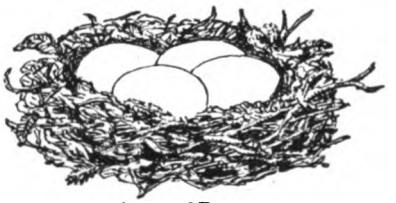


1. An owl egg



2. An old man egg

Picture 2 shows a funny surprise egg for the breakfast table. All we want for it is a pen and ink to draw the face and hair, and a little cap of red Turkey twill. A little egg-cosy embroidered with "Easter" makes a nice little present. Many are the faces and animals we can turn our eggs into by decorating the shell.



3. A nest of Easter eggs

Surprise chocolate eggs are a good idea. Boys who collect eggs and know how to "blow" them will find these easy to prepare. The empty shell is stood on its broad end, and two or three drops of melted chocolate are poured through the top hole. This must dry and harden to stop up the bottom hole. Then the egg is filled up with melted chocolate. To get this we take a bar of chocolate, put it in an empty jam-jar, and stand it in a pan of boiling water until the chocolate is melted, and can pass, by a funnel, through the hole in the egg. A little white sugar will cover up the dark spot, and great will be the surprise when the egg is cracked at table. The owl shown in picture 1 is a surprise egg of this kind, with little discs of crinkled paper for the eyes, a peak behind for the head, and two pieces for wings, all stuck on with a drop or two of gum. The feet are of bent wire, which is also bent into the form of a ring, in which the egg stands. That is easily done if we remember the barn-door cock made of bent wire as described on page 933.

We might make four surprise chocolate eggs and put them in a nest—not a real bird's nest, but one we can make ourselves. We first get some twigs and twist them together in the form of a nest—of course *ten* fingers can do what *two* small bills can do. A little glue will secure the twigs in place, and between them we arrange some real or artificial moss. Failing that, we can colour some green, or shred a little green crinkled paper. Pad the nest with little bits of cotton-wool and a downy feather or two, and then it is ready for the eggs, as shown in picture 3. A small basket, deep or shallow, is a good substitute for a nest.

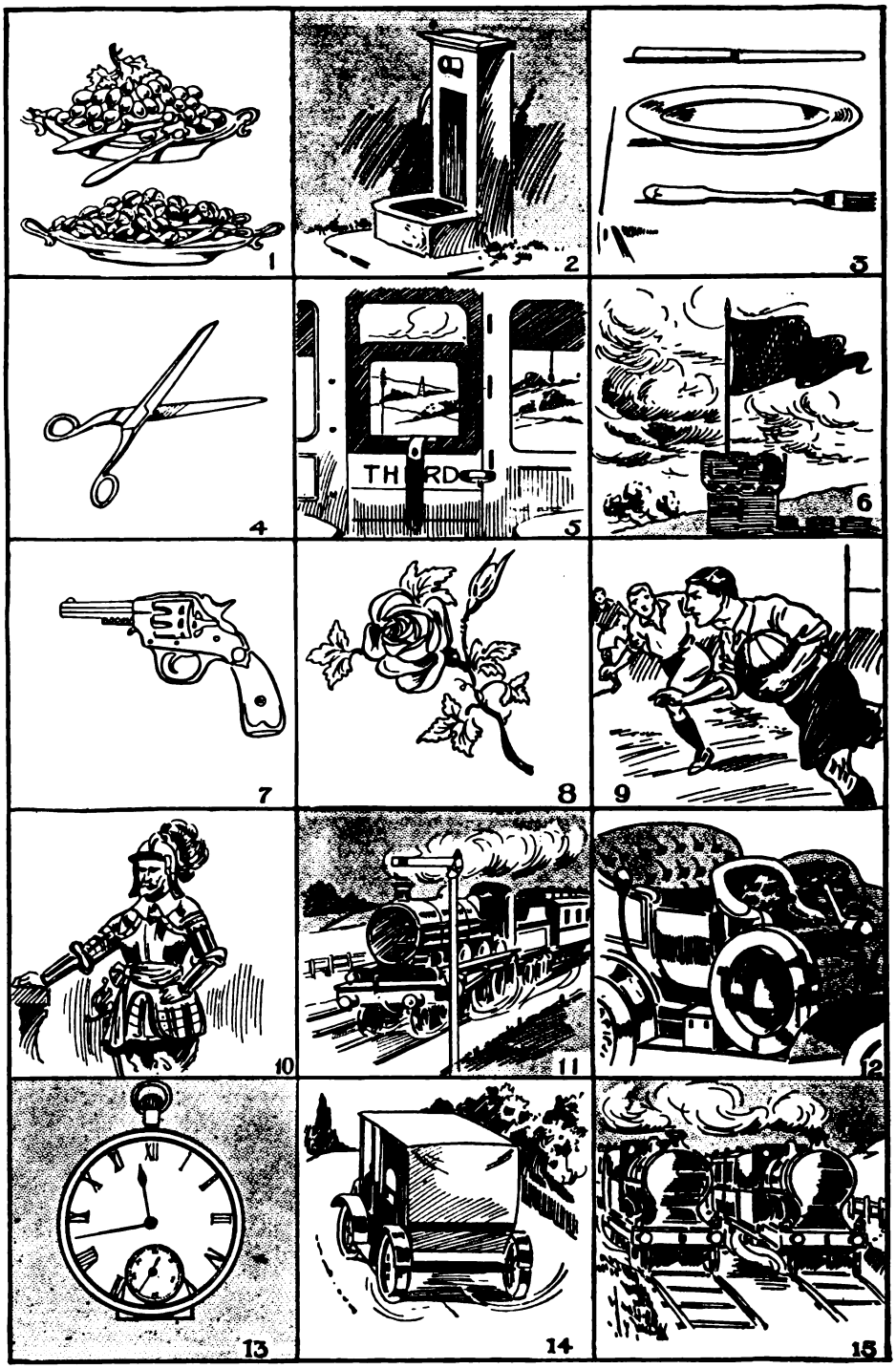
A surprise egg might be filled with a sweetmeat of icing sugar, which is pure and wholesome. Take some icing sugar and dissolve it in a few drops of cold water, so that it will run through the small hole in the shell and fill the egg. Then place the egg in boiling water a few minutes to harden it. The icing can be made pink by adding to it a drop or two of cochineal.

A novel idea is to shape an egg out of dates coated with chocolate or icing sugar, or both. We take three large, perfect dates, and, having broken them open lengthways and taken out the stones, press the fruit together into as compact an egg-shape as possible. Their stickiness will keep the dates together. We then dip them in melted chocolate several times till they are well coated, and cover them with icing. Two table-spoons will help us to get the egg-shape.

The pretty eggs in the shops are not always fit to eat, but the delicious little eggs shown in picture 4 are made of marzipan and sponge-cake. We get a quarter of a pound of ground almonds, a quarter of a pound of white sifted sugar, and one crumbled and sifted stale penny sponge-cake. We put these into a basin, and mix them with one egg and a few drops of essence of almonds, using a fork first, and then the fingers, and tasting the mixture to see that the flavouring is right. We then take a lump and shape it into the form of an egg in the palm of the hand. No cooking is needed, but the marzipan is better for being kept a day. If we want the eggs quite white, we can coat them over with a little sugar icing, made by moistening some icing sugar with a little cold water—only a drop or two. The eggs must be set to dry and harden in a warm place. These little eggs might be put into a screw of brown paper tied round with narrow yellow ribbon.

4. Marzipan eggs

WHAT IS WRONG IN THESE PICTURES?



There is something wrong in each of these pictures. It will help us to cultivate our powers of observation to try to discover the mistakes the artist has purposely made. They are pointed out on page 3398.

SAILOR'S HITCHES AND SPLICES

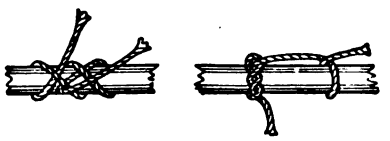
On page 235 we saw how sailors make knots. There are other ways in which sailors must make use of ropes—for instance, in making hitches, which are really a kind of knot, and in splicing ropes; that is, joining

1. The half hitch 2. The timber hitch 3. The clove hitch

two ropes together by uniting their ends without knots. In this article we see how to make hitches and how to splice ropes.

We show the simplest in picture 1. It is called a half hitch. We pass the end round a bar and its own standing part, and then down between its own part and the bar. The next, called the timber hitch, is made in the same way, except that the end is passed not once but several times round its own part, as seen in picture 2.

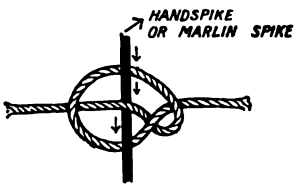
In making the clove hitch, shown in picture 3, we pass the end round the bar, cross it over the standing part, pass it round the bar again, and then pass it between its own part and the bar. The rolling hitch is made in the same way; but the second half of the operation consists in passing the rope twice round the bar, and in passing the end under both the turns, as in picture 4. The timber



4. The rolling hitch 5. The timber and half hitch

and half hitch is a combination of two hitches which we have already seen, and is made by making first a half hitch, and then making a timber hitch with the end part, as in picture 5.

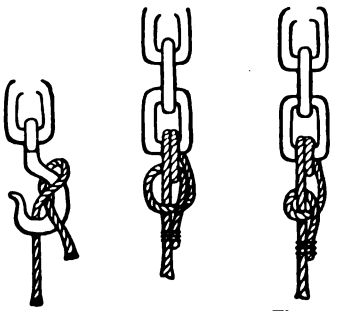
Now we come to what is called the handspike hitch. This hitch is frequently used by sailors when the two ends of the rope are fastened, and when they wish to exert pressure upon the rope. We make a loop in the rope first, and then pass the end of the bar through the loop, under the rope, in the loop, and then out through the loop again. It will then be as seen in picture 6. When we pull out the bar again, the rope is free, without any knot or hitch at all.



6. The handspike hitch

The Blackwall hitch, picture 7, which is used on board ship for suspending cargo from the hook of a crane, is made by passing the end of a rope round the back of the hook and under its own part, taking care that the two parts of the rope are on opposite sides of the hook.

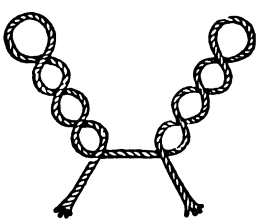
The fisherman's bend is used to fasten a rope to a shackle or ring. To make it, we pass the rope twice round the ring, and put the end through the turns. For security, the end must be tied to the standing part with strong string, an operation that is called "stopping back," as seen in picture 8. The round turn and half hitch is made in the same way, except that the end is passed through only one of the turns, as seen in picture 9.



7. A Blackwall hitch 8. The fisherman's bend 9. The round turn and half hitch

The series of loops seen in picture 10 is what is called a catspaw. We take a part of the middle of the rope, and form two bights, one of which we take in each hand and twist around an equal number of times, thereby making two loops, one at the end of each of the bights. A bar or spike may now be passed through the two loops.

We now come to the splicing of the ropes. This is more difficult than making knots or

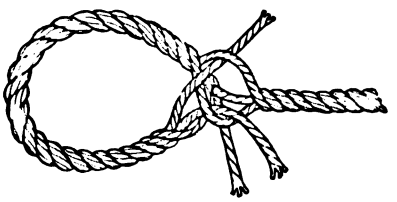


10. A catspaw

hitches, but it is a very valuable accomplishment, which, if once properly learned, should never be forgotten by us.

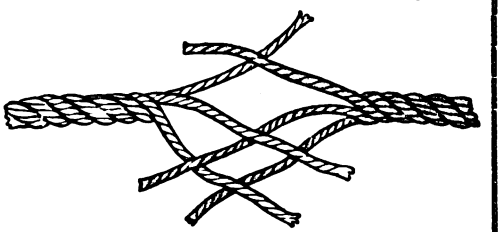
The eye splice is the method of making a permanent loop at the end of a rope. We take the end of the rope and unlay or open out the three strands for about 4 inches. Then we place these against the standing part at the spot which will give a loop of the desired size. We take the middle strand, and, after prizing up one of the strands of the standing part, pass the free strand beneath it. We then pass the other two strands, one on each side, under

the other strands of the standing part, and work the loop up tight, slightly tapering the strands by pulling off a little of the hemp. The usual practice is to cut one or more of the yarns composing the strands of the rope. After the first tuck has been completed with all strands, we pass them under the strands of the standing part again, taking care that each free strand passes over one of the standing strands before entering beneath the next strand. The ends are now again further tapered, and the process repeated a third time. All ends are now clipped off short after the splice has been well hammered, and then fine spun-yarn is bound round the joint. Binding with spun-yarn, when done the reverse way to the lay of the rope, is called serving. These instructions and the illustration shown in 11, if followed carefully, will enable us to make a good, strong eye splice.



11. The eye splice

To make a splice or join between two ropes, the ends of each must be unlayed, or unravelled, for a few inches. Then we fit the ends of each rope accurately together, so that the ends of one lie between the ends of the other. This is called crutching, or marrying the ropes. We now pass each strand over one strand of the opposite rope, and tuck it under the next strand. When this has been done once with each strand of each rope, as in picture 12, we taper the ends a little, and repeat the process a second time. We finally clip off the ends, and, if necessary, tie round with spun-yarn. A long splice is used where no increase in the circumference of the rope is required. To begin with, each rope must be unlayed about three times as far as for a short splice.



12. Marrying a rope

Then the parts are married, as in making a short splice. Now we take one of the strands of the right-hand rope, and unlay it still further, filling up the groove thus made with the corresponding strand of the left-hand rope. This must be done till only a short end of the left-hand strand remains free. We repeat the operation on the left-hand rope, filling up with the corresponding right-hand strand. We now have two long strands in the middle, and at some distance on each side of them there will be a very long strand and a very short one. We deal with each of these three points separately. We divide the strands at each point, and tie the corresponding divisions together, then take the ends at each point thus formed, and tuck them under the second strand, having passed over the first one. We must taper the ends, and tuck them a second time over a strand and under the second from it, then hammer and stretch the rope well, and cut off all loose ends. We ought now to have a rope almost as strong as if there had been no splicing, but as if it had been a rope made solid from the start.

HOW TO PREPARE A DAINTY TEA

EVERY girl, at one time or another, wants to give a tea-party, and she is anxious, of course, to make that tea-party a success. But it is not every girl who knows how to entertain her friends, even in this simple, delightful way. How should we set about it?

Of course, when we have invited our friends, and the day comes round, it is easy enough to find a confectioner's shop and to order some of the dainty cakes that will surely be on view there. But suppose we wish to be absolutely independent of pastry-cooks and confectioners, or suppose we are miles away from any shops. Be that as it may, we must make up our minds to be our own pastry-cook and confectioner, and make our own cakes.

Is that impossible? Not at all. With due amount of care, and provided that we do not undertake anything too elaborate, we can certainly turn out quite a charming little afternoon tea.

Suppose we arrange our little menu something after this fashion, the quantities, of course, depending entirely upon the number of guests expected:

Green butter sandwiches	Egg and anchovy sandwiches
One large cake	Small chocolate cakes
Small cakes	Almond jumbles
Brown bread and butter	White bread and butter

In cutting bread and butter, which must be our first consideration, we should always have two knives—one to butter with, the other, and the larger, to cut the rounds. And if the butter be hard and difficult to spread, it should be cut in pieces and warmed just to the right degree of softness, but on no account until it becomes liquid.

To make the green butter sandwiches, we pick the leaves from the stems of some fresh watercress, then, after being dried in a clean cloth, they must be chopped small. Now we take an ounce of butter, and with a knife mix the two well together, and add a small—the very smallest—pinch of cayenne pepper. This green butter should not be made until the day on which it is to be used, and the sandwiches are greatly improved if four sardines are skinned, boned, and mixed up with it. The

mixture is then spread on the bread, and made into neat sandwiches carefully cut into uniform size and shape.

To make the egg and anchovy sandwiches, we take two, three, or four eggs, according to the quantity required, and boil them hard. If they be placed in a vessel of cold water, they generally peel more easily than if operated upon as soon as cooked; also, it should be noted, eggs which are a few days old peel more easily than those that are very freshly laid. The yolks are separated from the whites, put into a basin, and well mashed with a fork, and a little anchovy paste or sauce is added to them and well mixed. This mixture must be covered until required for use. It should not be made until the day it is to be eaten. The sandwiches are made, shaped, and garnished in the same way as those already described. Sandwiches, and bread and butter too, when cut, should not remain uncovered any considerable time between the making and the eating. If necessary to prepare them some time in advance, the covers of vegetable-dishes may be mentioned as handy to place over them, or anything else that will effectually keep the air from drying and hardening them.

We must now turn our attention to the sweeter items—the cakes. Delicious little chocolate cakes may be made by mixing four ounces of flour, four ounces of sugar, four ounces of butter, a teaspoonful of baking-powder, and two eggs. We put all the ingredients together, beating the eggs separately and adding them last. We mix these well, and place them in a well-greased baking-tin. The mixture will require from a quarter of an hour to twenty minutes in a hot oven. When *quite* cold, cut it into strips and divide to half the thickness; spread a thick layer of chocolate mixture on the one half, and place the other half on it very neatly and carefully. The chocolate mixture is made by melting some sticks of chocolate in a little hot water to the consistency of very thick cream. If preferred, the cakes need not be split to half the thickness, but the chocolate can be poured over the top. Where this is done, the enthusiastic young cook may choose further to adorn with some pretty sweets placed upon the chocolate before it sets, or to use a preserved cherry for each strip.

For another dish of small cakes, we take the weight of two eggs in flour, butter, and sugar, and a quarter of a pound of currants, mixing all together thoroughly with one teaspoonful of baking-powder. If the mixture is scarcely moist enough as it stands, a small quantity of milk may be added. The young cook, however, should be careful on this point, as the tendency is to make cakes a little too moist.

To make the almond jumbles we must beat a quarter of a pound of butter to a cream, then add to it a quarter of a pound of castor sugar. We next mix separately two ounces of almonds beaten to a paste with the juice of a lemon, and one half-pound of flour. The whole is then thoroughly stirred together and mixed, made into small cakes, and baked for about a quarter of an hour.

The receipt for the large cake is omitted, as in almost every house there will be some favourite and long-tried recipe. But it may be well to add that the young cook must be very careful in baking her cake, the tin must be thoroughly greased, and for the first quarter of an hour after the cake has been placed in the oven it should not be looked at, to give it a fair chance to rise before the opening of the door sends a draught of cold air upon it.

It need scarcely be added that everything must be arranged as daintily and prettily as possible, and flowers placed here and there.

THE ROOM THAT IS ALL WRONG

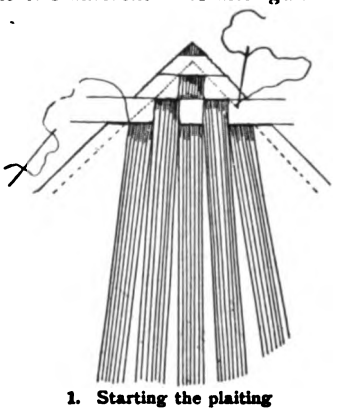
ANSWERS TO THE PICTURE-PUZZLES APPEARING ON 3175

ON page 3175 we have a picture of the interior of a room with seventeen things drawn wrongly in it. Here is a list of what they are. The door by which we enter the room has the finger-plates and handle and keyhole on the wrong side, being against the hinges. Going round the room we notice, first of all, the pictures: the oval picture is hanging from a hook which is placed upside down on the picture-rail; the next picture, a landscape, is upside down; and the one hanging in the corner has no hook at all. Looking down, we notice that the skirting board is reversed. We shall be surprised to find that the maid is about to shovel on to the gas-fire some coal she has taken from a coal-scuttle which has quite an impossible handle. This handle is round the bottom of the scuttle in such a way that it could not possibly be swung round for the purpose of lifting the scuttle.

The hands of the clock are wrong, as the little hand would point to a minute or so past the hour instead of just before it, if the minute hand was at the quarter past the hour. Let us go and look at the window. The fastener is the wrong way round, and the handle by which we lift the lower half has been fixed on back to front. Casting our eyes upwards we notice that the support for the curtain-pole is fastened on the top instead of at the side, which would prevent us putting the pole over it, and the knob by which we open the shutter is on its wrong side. Moving round the room we come against a hassock, the lugs of which are on the sides instead of on the ends. Let us take it up and we shall notice how very awkward it would be if hassocks were always made like this one. There is something strange about the dog too. It is a spaniel with a collie's tail. The chair behind it has been very carelessly upholstered, for the pattern is the wrong way up; the castor has been fixed on the wrong way round, and it would soon break with the weight of anyone sitting in the chair. Lastly, the floor-boards have been placed in in the wrong direction, and what would happen to them underneath the carpet is impossible to say.

A RIBBON CUSHION-COVER

RIBBONS are now obtainable in many shades of colour and in several materials. Besides being used for the ribbon embroidery work, they may be plaited. We propose to make a cushion-cover with plaited ribbons, a dainty one which is suitable for a drawing-room chair or a chesterfield. We shall want two different coloured double satin ribbons ⅜ of an inch wide. Two colours which combine well are pink and pale green. Other combinations of colours look well, such as pink and grey, heliotrope and violet, cream and bronze, or three shades of blue or of green, the choice being determined by the prevailing colour of the furniture and decoration of the room the cushion-cover is to go into. The quantity required depends upon the size of the cushion. The half "piece" of 18 yards is enough.



1. Starting the plaiting

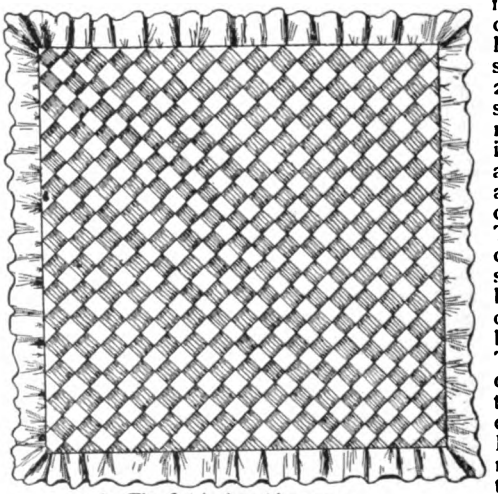
We intend using the plaited ribbon on one side of the cushion only. The back of the cushion-cover will be of cotton-backed satin or sateen in plain pale green or pink, to match one of the ribbons.

Having cut out the silk for the back of the cushion-cover, we set about arranging the ribbons. Picture 1 shows how the two ribbons are plaited together. The pattern is simple enough, but care is needed to lay the ribbons down across the cushion evenly, and to cut them precisely the right length, so that none is wasted. The longest strips are laid across from the left top corner to the right bottom corner before plaiting begins. The ends are shown loose in the picture. Suppose we start with a pink strip in the left top corner. We stitch this down to the back of the cushion-cover and lay a piece of the green ribbon over it, stitch the two ends down on the left side and on the right, and cut off both ends close enough up to leave room for stitching on a frill or braid later. This is the shortest length of green ribbon we shall use; but the pink one underneath goes right across the cushion to the opposite corner.

In the next row two pink ribbon lengtns are started, and a green ribbon is plaited over them both, and under the first one coming from the corner. As we proceed we plait more and more, each row, until the top and left sides are ended, and then plait shorter and shorter green lengths till the bottom and right sides are finished.

It should be said that the pink ribbon appears darker than the green in the picture, to distinguish between the two. The edges of the ribbon lengths should just touch. It will be found that the ribbon should not be cut till it is stitched down, that the stitches must be small and neat, and that the ribbon must be cut slantwise. The corners will need special care, for here, if anywhere, the ribbon is liable to bulge and refuse to lie flat. But a little coaxing and the use of a sharp pair of scissors should bring about a good result. Two needlefuls of silk will be in use at the same time, one for the left side and bottom, and one for the top and right side of the cushion. Nowhere must spaces appear in the plaiting. The ribbon has to cover the whole surface, but it must not be stitched on to the cushion anywhere.

When the plaiting is completed we make a frill of silk to match the green or pink, and run it on to the cut ends of the ribbon, round the edge of the cushion-cover on its under side, so that the stitches are invisible from above. Now our cover should look like that shown in picture 2. If preferred, a silk cord can be run along the edge instead of the frill, and loops of it made at each of the four corners of the cover. This plaited work can be done with sarsnet ribbon or braid, and the back of the cover can well be made of sateen. This would, of course, cost less than the cushion-cover described above. But, whatever materials be chosen, the ribbon should not be too flimsy, or we may be quite sure that it will wear out quickly, and all our work be lost. We can make other articles in plaited ribbon-work, such as handkerchief-sachets, tea-cosies, nightdress-cases, mats, and table-centres. Washing-ribbons are now manufactured, so that there need be no fear of the article being spoilt in the laundry.



2. The finished cushion-cover

THE NEXT THINGS TO MAKE AND DO ARE ON PAGE 3387.

READING

MORE PRONOUNS AND VERBS

CONTINUED FROM 3136

It is quite a long time since we had any proper sentences to read. We were so busy learning about HE, SHE, IT, and all the other little words, that we forgot to have a real reading lesson. We shall be surprised to find how we have been getting on with our reading all the time, though we forgot all about it in our last lesson. Here are some words that we shall be able to read quite by ourselves:

The BLACK PEN is MINE.

The LARGER of the two BOOKS is THINE.

This PRETTY GARDEN is HIS.

That WATCH is HERS.

Do you see that HOUSE? It is OURS.

Is the BROWN DRESS YOURS?

I like our DOLLS better than THEIRS.

When you have read all those through, look back for a minute at the last word in each of the sentences. What do you notice about these last words? That they save us the trouble of using a whole lot of other words: one little word does instead of several. In the first sentence, if we could not use the little word MINE, we should have to say: The black pen is the pen belonging to me; and in the second: The larger of the two books is the book belonging to thee, and so on. So because these words MINE, THINE, HIS, HERS, OURS, YOURS, THEIRS stand "for nouns," they must be PRO-NOUNS, just like our old friends HE, SHE, IT. Only the pronouns we have just been learning are called Pos-ses-sive, because they show that the persons possess, or have certain things. The pronouns that we learned in our last lesson were Per-son-al.

Now, suppose I shut my two hands tight, and held them out to you and said: "Now, which of my two hands will you have?" And suppose you had been watching very sharply and seen me slip a piece of chocolate into *this* hand, and a little stone into *that* hand, you would answer, like a shot, THIS. And, do you know, when you said THIS you were really and truly using a pronoun. Yes, and a new sort of pronoun, too. You never thought you were doing that, did you? And because THIS and THAT are used when we wish to point out something (though we are taught it is rude to point), they are called Pointing-out pronouns, or (if we wish to sound very clever) De-mon-stra-tive, which just means "pointing out." Have you read any of "Alice in Wonderland," or "Alice Through the Looking-glass"? If so, you will know something about Tweedle-dum and Tweedle-dee. Here is more about them:

YOU have heard of Tweedle-dum,
YOU have heard of Tweedle-dee,
WE are both so much alike, that
YOU can't tell HIM from ME;
How handy IT would be if one were
thin and one were fat,
For then you'd say at once: "Why,
THIS is THIS, and THAT is THAT."

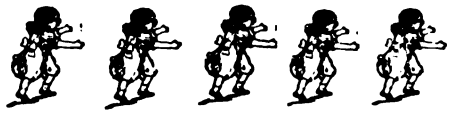
It is really very awkward when WE
both begin to dress,
Our clothes are so alike that we get in
a dreadful mess;
When I say "Tweedle-dum, my dear,
I'm sure this coat is MINE,"
HE always answers "Tweedle-dee, how
can my coat be THINE?"

Now we are coming to something new. We will begin by asking ourselves a few questions, and trying to read the answers.

How do babies move about before they are able to walk? CRAWL

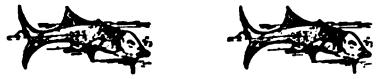
What do they do when they have grown a little bigger? WALK

What do you do when you want to get home from school quickly? RUN



How would you travel if you were a bird? FLY

And what do the little fishes do when they are asked out to tea? SWIM



And what do you do when you play hopscotch? HOP

Now, if you look at all those words that are printed in big letters, you will see that they all mean "doing something." They are not names of persons or things, like *man* or *table*. How silly it would be, when you were asked "How would you travel if you were a bird?" for you to answer "Table." And how everyone would laugh if, when you were asked "What are you sitting on?" you said "Swim." These two kinds of names are quite different, you see, and they must not be muddled up.

Now, we learned that the first kind of words was called NOUNS, and we had better learn for this lesson that this other kind is called VERBS. Every word that tells us something about what a noun is or does is a VERB. I think you will understand it quite well if we read a few more sentences together.

Cinderella LOSES her shoe.

Here LOSES tells us what Cinderella did, and so it is a verb. Cinderella, being the name of a person, is a noun.

St. George KILLED the Dragon.

In this sentence KILLED tells us what St. George did, and so it is a verb. In the next sentences, I am sure you can all pick out the verbs if you try:

Mary HAD a little lamb.
Who KILLED Cock Robin?
Tom, Tom, the Piper's son,
STOLE a pig, and away he RAN.
A stitch in time SAVES nine.
A soft answer TURNETH away wrath.
The Lord IS my shepherd: I shall not
WANT.
God IS love.
We LOVE Him because He first
LOVED us.

There is just one other thing that I must tell you, and that is, there must be a verb in every sentence. If you try to make a sentence without a verb, you may "try, try, and try again," but you won't succeed. Even in sentences with only one word in them, we find that word is a verb; such as HARK, LOOK, COME.

Now try to find all the verbs in this rhyme:

Hark, the clock strikes one, two, three,
We must give the dolls their tea.
Hark, the clock strikes four, five, six,
Nurse is calling Reg and Trix;
Now it's striking seven and eight,
Hurry up, or we'll be late.
By the time the clock strikes nine,
You're in your bed, I in mine.
But when the big hall-clock strikes ten,
I'm not awake to hear it then.
Eleven ends the big folks' day,
At twelve the fairies start their play.

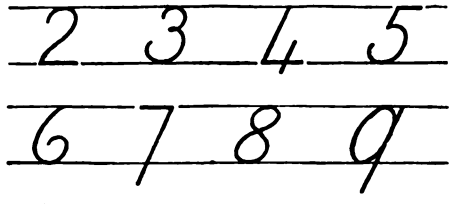
TOM AND NORA LEARN TO WRITE FIGURES

"BEFORE writing anything new, let us see how you remember all the capital letters, writing them in the order of the alphabet," said Tom and Nora's mother at their next lesson.

When they had written all the letters like that, they took two pairs of nail-scissors, cut the paper into squares with a letter on each, and asked each other the names of the letters.

"There is something very different to learn to-day—we are going to make figures. It is quite as necessary to make good figures as letters," said the children's mother. "You can make 1 and 0 already."

Tom and Nora had learned how to count, so they watched their mother write these figures:



"So many people make bad figures, and then mistake them for each other; but much trouble might be saved by making figures clear and plain without flourishes. Before beginning to write, let us talk about these figures. Tell me what you see."

Tom noticed the figures were all between the lines except 7 and 9, which had strokes for tails below the line. Nora saw that 3 and 5 had their lower parts quite alike, but 3 had a smaller curve for the upper part, while 5 started with a short down-stroke and had a cross-stroke from the top of that to the right. Both decided that 7 must be quite easy to make—just a line to the right and a down-stroke, and that 9 was like 0 with a short stroke and a tail to the right of it.

"What about 4? Let us look at it upside down."

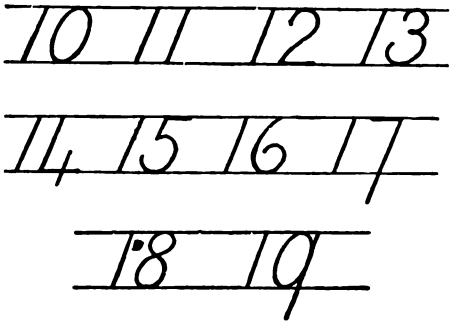
"Like a short 7 with a stroke through," said Nora. "Four is almost as easy as 7."

"6 is a curly tail," said Tom, "and 8 is like two little circles. Where does it begin and end?"

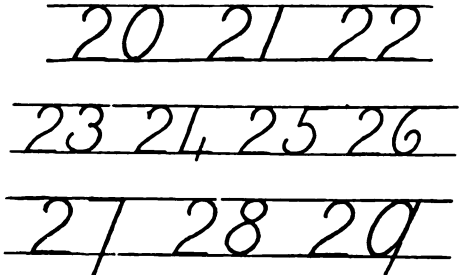
Nora said 2 reminded her of capital Q, but was ever so much smaller.

Then Tom and Nora took their pencils and copied rows of their mother's figures. They were puzzled to know where 8 started, but were told it should begin near the top at the right and curve up and round to the left, then down and round to the right to form the lower circle to join the beginning, and ought not to start the other way, for that would be like trying to wind a skein of wool from the wrong end. Nora smiled, for she had tried to do that very thing the day before.

When all the figures were nicely made, the children were shown how to put 1 before each figure to make the numbers 10 to 19, using the figures they already knew, just like this:



"Make the 1 quite distinct; never join it on to the next figure; and never start making it with a little stroke before it, for then it might be mistaken for a bad 7. The numbers from 20 to 29 are written with 2 before.



"In the same way we may use 3 for the thirties, 4 for the forties, 5 for the fifties, 6 for the sixties, 7 for the seventies, 8 for the eighties, and 9

for the nineties. All the other numbers are formed with the ten figures you already know."

For several days Tom and Nora practised making figures, and their mother gave them each a box of small square pieces of blank card, on every one of which they wrote a small letter, a capital letter, or a figure, and played at putting them together to make little words. At this time they were learning to spell short words, and so when their friends came to tea they brought out the boxes of their own letters, made words with the letters, and gave them to each other to find out the words they spelled. The one who made the most right words won the game. With the figures they made each other little sums to do, and sometimes they had a writing competition to see who could make the best and neatest letters in the shortest time.

Their mother was so pleased with their progress that she said they were ready to write words and little sentences, and that they should start to do so at the next lesson, and use pen and ink.

ARITHMETIC

SUBTRACTING SEVERAL NUMBERS AT ONCE

IN this lesson it will be well to go back for a while, and learn a little more about subtraction.

In Lesson 9 we saw how to subtract *one* number from another. Let us see whether it is not just as simple to take away several numbers at once from the other number.

The method we used for subtracting 347 from 635 was this. We placed 347 under 635, so that units were under units, tens under tens, and so on. Then we found what must be *added* to 347 so as to make 635. First, we made 7 up to the next number ending in 5—that is, 15, saying 7 *and* 8 make 15, and writing 8 in the answer. Next, the 1 of the 15 (which is 1 *ten*) makes the 347 into 357; so we went on, 5 *and* 8 make 13. Put 8 in the ten's place of the answer, and carry the 1 of the 13. This 1 is 1 hundred, and we therefore had 4 hundreds in the lower number, which required 2 more to make 6.

```
635
347
---
288
```

Now, by using this same method, we can easily take away several numbers at once from a given number. We have only to add the several numbers together, and make the total up to the other given number. An example will make this clear.

Take away the sum of 349, 17, 1241, and 406 from 5927.

Write the numbers down exactly as for an addition sum—that is, place all the unit's figures in a column, so that tens come under tens, and so on. Put the number 5927, from which the others are to be taken, first; separate it from those below by drawing a line under it. Next, add together the unit's figures of the numbers which come below this line. Say, 6 and 1, 7; and 7, 14; and 9, 23; or, what is better still, say only, 6, 7, 14, 23. Now, having found the total, 23, we have simply to say how much must be added to 23 to make it up to the next number above 23 which ends in a 7 (since the unit's figure of our top line is a 7). This number is, of course, 27, and we know that 4 must be added to 23 to make 27. We write 4 in the answer, and carry the 2 (tens) of the 27 to the next column.

```
5927
----
 349
  17
1241
 406
----
3914
```

We now repeat the process with the ten's column, saying 2, 6, 7, 11, *and* 1 *make* 12. Put 1 in the answer, and carry the 1 of the 12 to the next column. Next, for the hundred's column, we have 1, 5, 7, 10, *and* 9 *make* 19. Put down 9 in the answer and carry 1. Finally, 1, 2, *and* 8 *make* 5. Put down 3.

We see, then, that when the given numbers are subtracted from 5927 we have 3914 left. We can test whether our answer is right by adding together all the numbers except the 5927. If the working is correct the answer, 3914, and the four numbers 406, 1241, 17, and 349 will make the number 5927.

This perhaps sounds rather difficult, but it only appears so because the explanation is long. The process is quite as easy as an ordinary addition sum. In the following example no

more has been written down than we actually say to ourselves in working the sum.

How much is left after 528, 1102, 347, and 129 have been taken away from 3016?

```
3016
----
 528
1102
 347
 129
----
 910
```

Say, 9, 16, 18, 26; and **0** make 26. Carry 2. 4, 8, 10; and **1** make 11. Carry 1. 2, 5, 6, 11; and **9** make 20. Carry 2. 2, 3; and 0 make 3.

As we come to each figure in heavy type we write it in the answer.

It may happen that all the numbers to be taken away are the same. In that case we can use our multiplication table.

How many marbles will be left out of 850 after 5 boys have each had 133?

Instead of writing 133 five times, we write it once, and place a 5 under

```
 850
----
 133
   5
----
 185
```

its unit's figures, exactly as we do for multiplication. In fact, we are simply going to multiply 133 by 5, and make the result up to 850. Thus, we say, five 3's, 15; and **5** make 20. Carry 2. Five 3's, 15; and 2, 17; and **8** make 25. Carry 2. Five 1's, 5, and 2, 7; and **1** make 8. So, the result is 185.

The following examples are to be worked in the way we have shown:

1. Take the sum of 782, 6031, 13, and 519 from 8207.

2. Find the remainder when 3912, 4608, 353, 97, and 1029 are taken from ten thousand.

3. Add together 129, 1008, 36, 508, and take the result from 3021.

4. Subtract 7 times 154 from 2540.

5. Subtract 8 times 643 from 5162.

MUSIC

THE "SLEEPY ARM" GAME OF THE FAIRIES

TO-DAY we are really going to think about the best way of getting the piano fairies to talk to us. They are very particular little people, and it is quite right to be particular, for there is always a right way and a wrong way of doing things, and we must be careful always to find the right way.

If we approach the fairies' kingdom—in other words, the piano—in the proper way, their voices will sound really beautiful; but if we *hit* the notes instead of loving them we shall get very little beauty from them.

How we should sit to play the piano

First of all, we must find our seat, and we must place it so that when we sit on it we shall be immediately opposite the middle of the piano, and the seat must be far enough away to allow our elbows to be in front of our body. Now we will put our hands on the notes, but we will not press them down just yet. We have to be so sure that our fingers are rounded, that the back of the hand is quite level, and that we have a horizontal line from the elbow to the fingers. This must be our position when we play the piano. The little girl in the picture on page 3133 is not sitting in at all the right way.

The fairies know that all this is so important, they are very anxious for us not to forget, so we will make ourselves very safe and sure by saying it all over again.

1. Our seat must be immediately opposite the middle of the pianoforte.

2. We must sit far enough away from the piano to allow our elbows to be well in front of our body.

3. Our fingers must be nicely curved, so that we touch the notes with the little fleshy tops which Nature has given to us.

4. We must have the back of our hand quite level, and a nice horizontal line from the elbow to the fingers.

If we think of all this, and watch ourselves very carefully, the fairies will be very pleased Even now they are anxious for us to feel quite happy, and not at all tired, so they say that if our legs are not quite long enough to reach the ground, we must have a footstool for our feet. Do you not think they are very thoughtful little people ?

They have something else they want us to do to-day, as well ; they say we must have a very *loose* arm, and a very *loose* wrist. When we want to walk we do not make our legs as stiff as a board, do we ? We just let them move easily, and that is how we must walk on the piano, only we shall use hands and arms, instead of feet and legs.

Here is a little game which the fairies want us to play. They have a funny name for it, they call it "The Sleepy Arm." We can come away from the piano, and sit down anywhere we like for a change. We let our hand rest quite easily on our lap, then we throw it up above our head and keep it there while we count 1, 2, 3, 4.

Directly we have said "four," we pretend we go fast to sleep, and our arm will drop. It must be quite limp, just like it would be if we were asleep. Its own weight makes it fall, like a ball drops to the ground after we have thrown it up into the air.

Shall we see how easily we can make our arm play at being asleep before our next little talk ? We will play this game ever so many times each day, for the more often we play it the more free will our arm become.

The fairies think we ought to have a story as well as a game, so here it is :

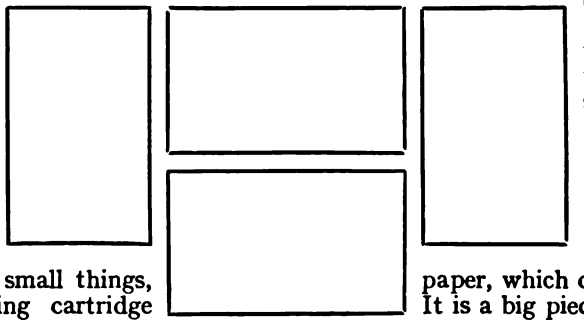
In the ever so long ago, there lived a little boy who loved the music fairies with a great and wondrous love. He had a toy which was his great delight—a wee orchestra of trumpets, horns, drums, and Jews'-harps. The father was not quite so fond of the music fairies, and tried to make his little boy forget all about them ; but this was quite impossible, for when music was forbidden our poor little friend was very, very sad.

But there was a kind "somebody" who knew how the little one was fretting to hear the music fairies tell their sweet stories, and this kind someone managed to smuggle a clavichord into a garret in the top of the house. A clavichord, of course, was a musical instrument, which came before the pianoforte. There was one very funny thing about it. The lower notes which on our piano are white were black, and the upper notes which on our piano are black were white. It seems a funny instrument to us, but it made our little friend so happy, for he taught himself how to play. He used to go to the churches and hear beautiful music, and then he would come back and run away to his little garret, where his beloved clavichord lived, and persevere till he could make the fairies sing sweet songs to him. This little boy was George Frederick Handel, one of the greatest composers this world has ever seen.

DRAWING

PUTTING ON A GRADUATED WASH

In our painting lessons we have always pinned our drawings on our boards. If our paper has been thin, or if we have soaked it too much, we have sometimes found it crinkled on the surface, which, of course, spoils a flat wash. When we are colouring only small things, and are using cartridge paper, this need not happen if we are careful to damp all the surface equally, and not too much ; but when we want to colour big things very nicely, we can try another sort of paper, and fix it to the board in a better way.



We will get a sheet of water-colour paper, which costs ten cents. It is a big piece, so we will

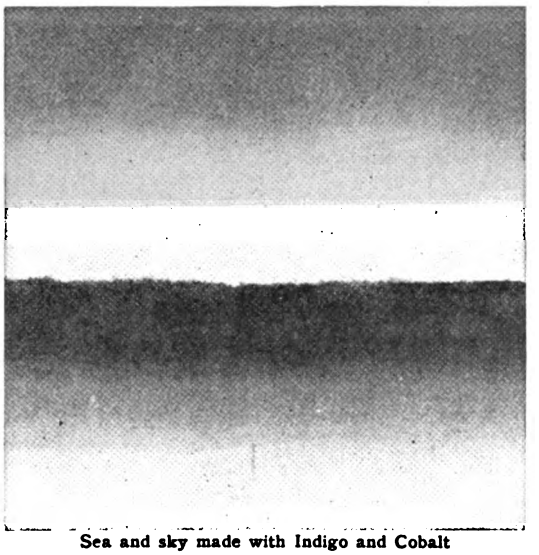
only use half of it to-day. Now, we shall want some Stickphast Paste, or some very strong gum, with a brush or a sponge. We must take our paper and thoroughly soak it in cold water—the bath is the best place to do this. Then we must lay it on the board, and after squeezing the sponge well, press out some of the water in the paper all over with it till it lies quite flat. Then we lift up the edges and paste the board about an inch underneath the paper all the way round, then press the paper down and leave it.

This is a wash with one colour

We have only made our flat washes in one colour all over, so far, even when we changed primary colours into secondary and tertiary colours. Now, we are going to put different shades of the same colour on one part of our paper, and two colours together on the other part. We will first rule some oblong shapes on the paper. An oblong, of course, has two sides longer than the other two. We make the short sides three inches, the long sides five inches. We rule four oblongs, two with short sides at the top and bottom, and two with long sides at the top and bottom, in the position in which we see them on page 3292. We will paint our first oblong in blue to match the sky; but we cannot put in any clouds yet.

We must just slightly damp the surface of the paper and blot it in the usual way; then we must take a brush quite full of blue paint, just wet enough to work easily, and paint one row along the top of the first oblong. For the next row we must dip the brush in clean water first, and then in the paint, and repeat this to the bottom. This fresh water, mixed with the colour, will make it paler each time, till at the bottom row it is quite light—as if Oxford blue were at the top and Cambridge at the bottom. This is called putting on a graduated wash. We learned something about it on page 493.

We try this again on the other oblong, choosing a mixed colour—green or violet—mixing plenty, because we cannot match the colour again. On the two other oblongs we will use two separate colours. We can take two colours from the sunset sky—cobalt blue to light red, beginning with the blue as before; but half-way down we wash the brush and take a little light red, mixed with plenty of water to make it paler, and paint across next to the blue. The blue edge will melt into the first red edge, and as we go downwards the red shows by itself till it grows almost white on the bottom line. We will do the same thing with two other colours on the oblong that is left.



Sea and sky made with Indigo and Cobalt

LITTLE PICTURE-STORIES IN FRENCH

First line: French. Second line: English words. Third line: As we say it in English.

Aujourd'hui nous irons à Versailles, où demeurait une fois une belle reine.
To-day we shall go to Versailles, where dwelt a time a beautiful queen.
To-day we are going to Versailles, where a beautiful queen once lived.

Nous arrivons à deux heures, et allons en voiture au palais, un édifice splendide.
We arrive at two hours, and go in carriage to the palace, an edifice splendid.
We arrive at two o'clock, and drive to the palace, a fine building.

Nous traversons les chambres et regardons les beaux ameublements.
We traverse the rooms and regard the beautiful furniture.
We walk through the rooms and look at the beautiful furniture.

Il y a beaucoup de tableaux sur les murs. J'aime les tableaux de batailles.
It there has much of pictures upon the walls. I like the pictures of battles.
There are many pictures on the walls. I like the battle pictures.

Nous voyons de drôles de lits. Ils ont un petit escalier sur le côté.
We see some droll of beds. They have a little staircase upon the side.
We see some funny beds. They have a little staircase by the side.

Les lits sont si hauts qu'on doit monter deux marches pour se coucher.
The beds are so high that one must to mount two stairs for oneself to go to bed.
The beds are so high that one has to go up two steps to go to bed.

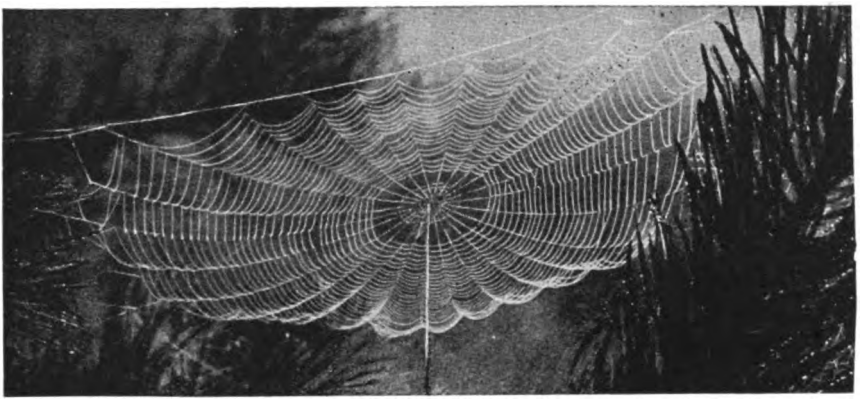
Nous quittons le grand palais et nous entrons dans Le Petit Trianon.
We quit the great palace, and we enter into the little palace.
We leave the big palace, and we go into Le Petit Trianon.

La reine et ses amis demeuraient ici quelquefois dans de petites maisons.
The queen and her friends dwelt here sometimes in some little houses.
Sometimes the queen and her friends lived here in little houses.

Jeannette arrache un peu de lierre de la muraille et le met à sa robe.
Jenny plucks a little ivy from the wall and it puts at her dress.
Jenny plucks a little bit of ivy from the wall and puts it in her dress.

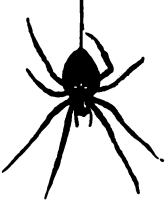
Nous n'oublirons jamais le jardin de la malheureuse reine, Marie Antoinette.
We (not) shall forget never the garden of the unhappy queen, Marie Antoinette.
We shall never forget the garden of the unhappy queen, Marie Antoinette.

THE NEXT SCHOOL LESSONS BEGIN ON PAGE 3369



THINGS THAT CREEP & CRAWL

CONTINUED FROM 3264



It is quite a good game to take a big bunch of keys and find the locks which all the keys fit. A key of itself is a useless bit of steel; but if it can be made to turn a lock it becomes an article of value. Naturalists find the same satisfaction, only on a larger scale, in fitting the little things of the animal world to their purposes in life. The keys were made to fit locks, and we, taking them as they come, have to find their places. Nature has a purpose for all her creatures, and it is for us to discover what that purpose is.

Some of Nature's creatures seem to have departed from the work for which we imagine them to have been created. We cannot think that flies and mosquitoes were made to inflict death upon men and beasts. They have departed from their original purpose, we think, just as men who thieve and kill other men have departed from their original purpose. On the other hand, we think that many things in the animal world are horrid, if not harmful, when really they are quite good friends to man. Most of us dislike creepy, wriggly things. Centipedes and spiders are among the things which fill most people with horror. Well, we must do with them as we have done with so many other things, examine the purpose which they serve in life, and realise the value of the part they play in the scheme of creation. First let us look at the centipedes—those long-bodied creatures with many legs which we find hiding in dark places, under stones, behind the bark of trees, and so on. When a centipede is discovered, a child generally feels as if it must crush the miserable thing.

To do so is foolish, for the centipede of this country does only good. It devours worms and insects, and is a check upon the too rapid increase of these. Many of the centipedes are blind. Those that have eyes can distinguish light from darkness, but little more. The antennæ supply the place of eyes. With these they feel their way along the ground, and discover things good for food. All the centipedes are flesh-eaters, hence the value in the garden of those that live in this country.

Northern centipedes are small compared with those that flourish in tropical lands. But we notice a peculiarity about ours which distinguishes foreign centipedes as well; they all have many pairs of legs,

but the number of pairs is always odd. Centipedes never have a dozen pairs or a score of pairs, or even a hundred pairs; they never have anything but odd numbers of pairs, whether it be fifteen or 121 pairs. Many people cannot tell the difference between a centipede and a millipede. There is a distinct difference. The centipede has one pair of legs to each segment of its body; the millipede has two pairs of legs to most of the segments of its body.

CENTIPEDES THAT EAT FLESH AND MILLIPEDES THAT EAT HERBS

The centipede is, as we have noted, always a flesh-eater; the millipede lives only on vegetable food. A further distinction between the two may be noted in the shape, for whereas the body of the centipede is flattened, that of the millipede is shaped like a cylinder.

There are only two classes of centipedes, but the families included are numerous and they vary a good deal. The most famous are those which live in the hot countries of South America. These may well terrify people, for they grow to a length of twelve inches, and their bite is poisonous—not poisonous enough to kill a man, but bad enough to cause him pain. They live in hiding all through the day, but where human beings are, these great creatures creep into bedding, boots, gloves, and other clothing. A man goes to put on his boot, and finds a huge and savage centipede inside, which promptly bites him, and causes a bad swelling on his foot. Of course, creatures like these are much hated by men, but they do good work when left alone. devouring multitudes of cockroaches, beetles, and other unpleasant and injurious things.

A GIANT CENTIPEDE IN LONDON THAT FED UPON MICE

It is hard to say what they will not eat. They have been known to devour lizards bigger than themselves, and one kept at the London Zoo fed upon mice. Other centipedes may be found hiding near the seashore, while others live down in the soil like the worms upon which they live. To the earth-worms these centipedes must seem like terrible boa-constrictors, for the centipedes twine themselves round their victims while they eat them. The millipedes lack the poison duct which the centipedes have, and they possess only two pairs of jaws—half the number owned by the centipede. There are many sorts and sizes of them, but they are all harmless, unless they neglect their task of eating waste vegetation, and take to destroying useful plants. Two curious forms are the slug millipede, a creature with an enormous number of legs, which can roll itself up, and the pill millipede, which curls itself up like a tiny hedgehog. For that reason it is sometimes confounded with a totally different little animal, the wood-louse. This belongs to the same family in Nature as the crab and the shrimp, being a crustacean, though it lives on land.

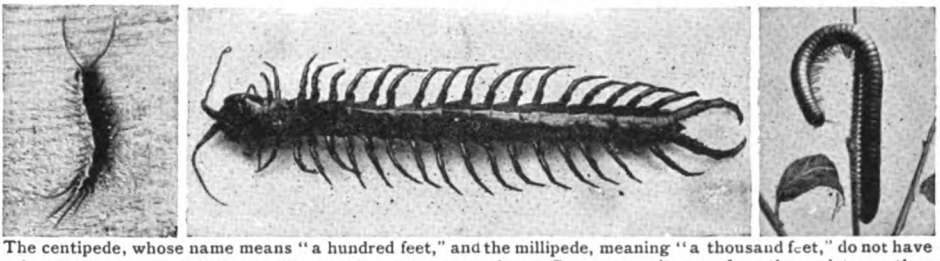
There are about 250 species of wood-lice, but the one which we may notice here is that one which, as soon as it is touched, converts itself into a little ball. We need not stay to discuss it here, but must just note in passing that the life-story of this humble little animal is one which causes wonder to learned men. Its habits are the source of much trouble to gardeners, especially English nursery gardeners, who grow things in hothouses for market.

THE SERIOUS DAMAGE THAT THE WOOD-LOUSE DOES IN OUR GARDENS

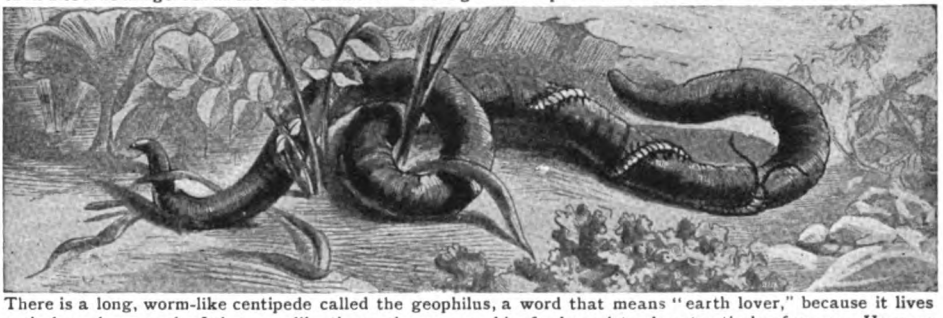
The wood-louse is one of the worst foes of the man who grows costly maidenhair fern. The creature loves the tender shoots of the fern, and, taking itself and its family of little ones to the root of a plant, there it settles and secretly gnaws away at the stalks, sucking out the vital juice of the plant.

The damage that these crustaceans do in this way almost passes belief. They cannot always be killed by putting down stuff to destroy insects, for that would be too costly, and the same things which kill the wood-lice may at the same time kill the plants. The only thing to do seems to be to take each pot separately and shake out the wood-lice which it contains, and kill them. Think what a task this means when a nurseryman has thousands and thousands of pots. Before the pots can be cleared of their enemies, the latter may have done such harm as cannot be remedied. When the pots have been cleared of wood-lice, the nurserymen have to plan to keep them free. They tried to do this by raising on tins the wooden staging on which the pots stand. But, as soon as

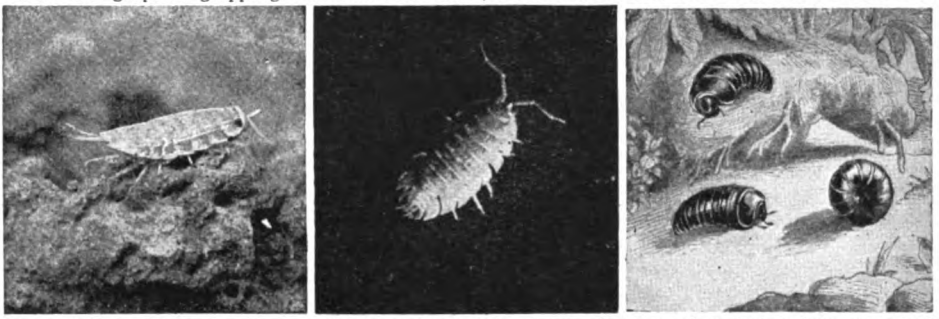
CENTIPEDES, MILLIPEDES, AND MITES



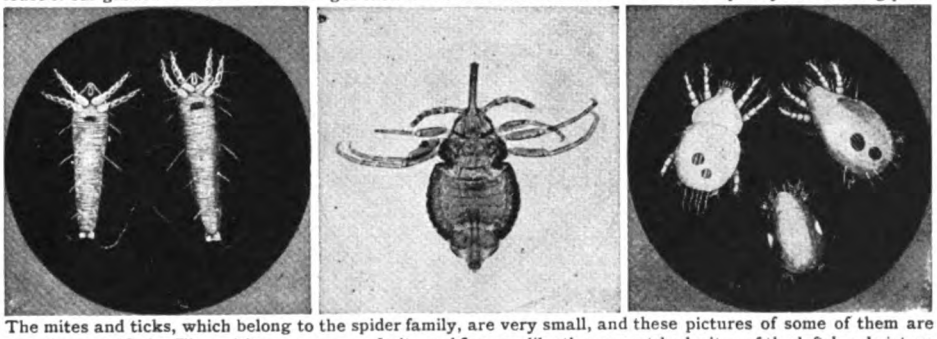
The centipede, whose name means "a hundred feet," and the millipede, meaning "a thousand feet," do not have a hundred and a thousand feet; their names are exaggerations. But, as may be seen from these pictures, they have many feet. On the left is the common centipede of our gardens, and on the right the common millipede. The middle picture shows one of the giant centipedes of the tropics, which grow sometimes a foot in length, and their bite is as dangerous as the bite of a snake. These great centipedes have been known to eat lizards and mice.



There is a long, worm-like centipede called the geophilus, a word that means "earth lover," because it lives entirely underground. It burrows like the earth-worm, and its food consists almost entirely of worms. Here we see the thin geophilus grappling with a fat earth-worm, which it has seized, and which it will eat later on.



We should not suppose that the wood-lice, those funny little creatures in our gardens that curl up into a ball when touched, belonged to the same order as the crabs and lobsters. Yet this is so. The wood-lice are crustaceans, but they cannot all roll up; and here we see, on the left, the giant wood-louse, and next to it the common wood-louse, neither of which rolls up. On the right is the pill millipede, that is often mistaken for the pill wood-louse of our gardens. These creatures get their names from the fact that when rolled up they look like big pills.



The mites and ticks, which belong to the spider family, are very small, and these pictures of some of them are greatly magnified. They either ravage our fruits and flowers, like the currant-bud mites of the left-hand picture and the bulb mites on the right, or they prey upon other creatures like the elephant-tick of the middle picture. Small insects, birds, and large animals, all have their pests in the form of mites and ticks that live upon them.

the tins got rusty, the wood-lice crawled up and reached the pots. Then they did away with the tins and used glass jars as supports. But the wood-lice were not to be beaten even by this trick. They crawled up the wooden rafters of the glasshouses, and then, curling up, let themselves drop into the pots below.

AN ENEMY OF THE GARDEN AND GREENHOUSE THAT MAY BECOME A FRIEND

At a single nursery where there are only fourteen greenhouses the wood-lice do damage amounting to $250 a year. Think, then, what damage they do altogether in the hundreds of nurseries of a bigger size, where ferns and other things that they like are grown. If denied ferns and other luxuries, the wood-louse can live extremely well on waste vegetation; and, by eating that, it is a benefactor to man.

We will leave them to their wickedness, and pass on to those interesting "insects," the spiders. As a matter of fact, they are not insects at all. Insects have only three pairs of legs, but spiders have four pairs. They, with the millipedes and centipedes, the scorpions and mites, belong to a division of the animal world not included in the insect family. But, by whatever scientific name they may be called, every child knows a spider when he sees one.

Not every child, however, understands how marvellous is the skill, how extraordinary the character of the work done by the spider. It is the finest spinner in the world. It does not provide silk as good as that which comes from the silkworm, but it provides silk enough to make the most wonderful floating buildings in the world. The fineness and strength of a spider's web can never be matched by man.

THE SPIDER'S WONDERFUL WEB THAT IS STRONGER THAN A FRAME OF STEEL

What is the web, and how does the spider produce it? The web, before it leaves the spider, is a kind of gum. When it issues from the body of the spider, it takes the form of the finest silk, almost too thin to imagine, but stronger, in proportion to its thickness, than steel bars. The spider is generally provided with six tubes—sometimes there may be only four—placed in the lower part of its body. Each of these tubes is more than a tube—each is really the finest of fine sieves. The silk does not come out in one strand from the tube. There are a thousand holes to this sieve that the tube encloses. From each hole the silk comes forth as a separate thread. The thousand threads issuing from each tube combine to form one thread. But there are six tubes we remember. Then the six threads, each formed of a thousand or more threads, combine again to make the one thread of which the spider builds its web.

Every bit of web that we see may contain from 4,000 to 6,000 strands of silk, all woven together to make the finest natural rope in the world. A careful man has calculated that the threads of silk, as they issue from the thousands of holes in the sieves, are so fine that it would require four millions of them to form a silk thread as thick as the hair of a man's beard. So small are the holes in the sieve through which the silk is drawn by the spider that a thousand of them are crowded together in the space covered by the point of a pin.

THE TERRIBLE FEMALE SPIDER THAT EATS HER HUSBAND

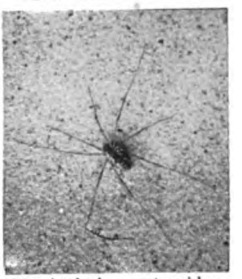
We may see the wonders of spider life for ourselves, for every garden has its spiders, and there is no web-spinning spider more interesting than the big fat queen of the cobwebs who dwells on bush and shrub in the garden. It depends on the weather how she will begin. We say "she" because the female spiders are the more important. The males are small, and are more often than not eaten up by the females after the wedding-day. In fact, they may be gobbled up even before the courtship is over. The lady spider is the most terrible sweetheart in the world. We will leave out of account all male spiders, therefore, and watch a female. It depends, we agree, upon the weather how she will begin to build.

She starts by drawing forth a little quantity of silk. This she does by rapidly moving certain very sensitive wavy hairs upon her legs. She fastens the end to the place on which she is standing. Then she may have to run away to another point, to fix the other end of the web there, letting the silk trail out as she runs. But if there is a wind blowing she does as the smaller spiders do—lets her silk float free for the wind to carry it, and cause it to stick to some point where it can be made

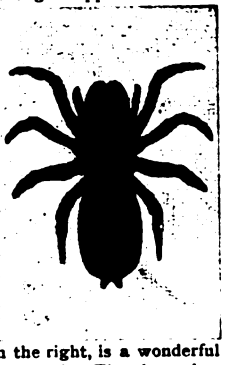
LAND SPIDERS AND WATER SPIDERS

This is the female of the common garden spider. She is much larger than the male, whom she often eats.

The common house spider does not build a beautiful geometrical web like the garden spider, but makes its web flat, as seen here. The web is only too well known in our houses, where the spider spins in dark corners.



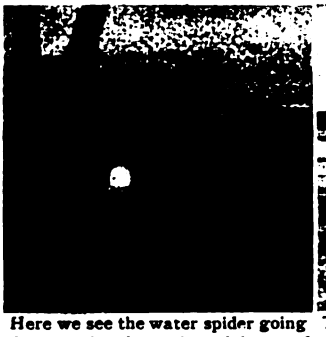
The little harvest spider, so familiar in our fields, is not really a spider although it appears like one.



The trapdoor spider, of which we see the upper side on the left, and the under side on the right, is a wonderful little miner. He burrows a shaft, or tunnel, a foot deep and an inch wide, and lines it with silk. Then he makes a little door to the tunnel, and fastens this by a hinge. The spider lives at the bottom of the shaft, as shown in the middle picture, and when he hears an insect upon his trap-door, he darts out in a moment and seizes it.

Here we see the entrance to the trap-door spider's home closed in the left-hand picture, and open in the right

The water spider, shown here, is a most interesting creature. Though born under water, it must breathe to live, and so, when it dives, it carries to its home a big round bubble of air.



Here we see the water spider going down to its dome-shaped home of silk. The entrance being underneath, the spider can fill its nest with air, which is unable to escape.

This is the wonderful raft spider, that makes and floats upon a neat little raft of leaves. When she sees a fly in the distance she leaves the raft and darts after it across the water.

The photographs on these pages are by Miss Cadly, F. P. Smith, D. English, S. Johnson, W. S Berridge, W. P. Dando, P. Collins, and others

fast. The web is sticky, and clings to whatever it touches. Now she has got her tight-rope, and runs rapidly over it, and makes supports in all directions, lines which cross from side to side, fixed at both ends, but all passing through the exact centre of the web. Next she begins at the middle, and works out a spiral pattern of four or five rings, which fill out the centre of the web, and make it strong for her other work. The real business has yet to come. She now goes to the outer portion of the web, and, spinning all the time, works round and round, leaving a line of silk all the way, gradually drawing nearer and nearer the centre. This is the part which has to catch the flies. The part first done in the centre does not matter now. The spider may even take it to pieces and eat the silk, for it to be formed again in her body into fresh material for silk.

When the web is finished, the spider may need her own nest. She may decide not to remain in sight upon the web, lest insects seeing her should flee.

THE FIERCE POUNCE OF THE SPIDER THAT MEANS DEATH TO THE FLY

Generally speaking, the garden spider does run the risk, but others do not. These others make a little nest of silk hidden away — a hiding-place nest which generally has two openings, top and bottom. Threads lead from the web to this nest, and the moment any insect touches the web these threads vibrate and warn the spider that a stranger has entered. She does not ask him to walk into her parlour. She springs out of hiding, rushes along the web with her clawed feet, pounces upon the insect, poisons it with one swift thrust of her weapon, then feasts upon its blood.

But suppose there should be more than one fly in the web at a time? The spider does not waste food. This is what a very big one in a garden did when a bluebottle-fly entered her nest while she was feeding upon another fly. With a buzz and a kicking and fluttering the bluebottle announced his arrival. He could not escape, for the net was too sticky. But there was just a chance that he would do some damage. The spider ran no risks. She uncoiled her legs from the fly upon which she was dining, and rushed like a flash across the web to the bluebottle. She grappled with him, and, with one movement, made it impossible for him to get away. She did not kill him, but seemed to stupefy him. For a few seconds she was busy with her claws round him, then suddenly the big bluebottle began to spin round and round on a thread of silk, her claws making him spin. And, lo, in a twinkling, he was completely wrapped in a sheet of silk.

THE MYRIADS OF PESTS THAT THE SPIDERS DEVOUR

She had spun a cocoon all over him, and she now hung him up in this cocoon in the web, and went calmly back to her first meal, leaving him until she was ready to eat him at her leisure. It is of no use pretending that we love spiders, because we do not. We all shudder at their work, but at the same time we know that they are among the greatest friends we have in destroying, every summer, myriads of flies and harmful insects which, if left to multiply, might make our lives almost unbearable.

Leaving out of account the seeming cruelty of the spider's life, which, after all, is no worse than that of the beautiful birds which live, as she lives, upon insects, we can all admire the wonder of her building. That nest of hers is so strong that the wind will not blow it down, and heavy dew will glisten in its meshes without breaking a thread. The strength of each strand of silk in the web is wonderful, but the strength of the whole, thanks to the beautiful way in which it is made, can scarcely be believed. A scientist has tried to make it plain in this way.

Let us suppose, he says, that a child can lift a six-pound weight one foot high with 350 rubber bands, each band capable, when stretched, of pulling six pounds a distance of one foot. Let these bands be fastened to a wooden platform, on which stand two horses, weighing 2,100 pounds, or nearly a ton.

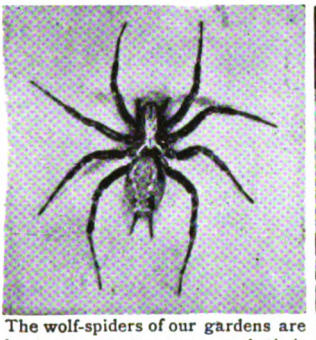
THE MARVELLOUS STRENGTH OF THE SPIDER'S TINY SILK THREADS

If, now, the child will set to work and stretch these rubber bands one by one, hooking each one up as it is stretched, in less than twenty minutes that child will have raised the pair of horses a distance of one foot. The elasticity of the rubber bands enables the child to divide the weight of the horses into 350 parts of six pounds each, and,

SPIDERS AND SCORPIONS WITH THEIR PREY

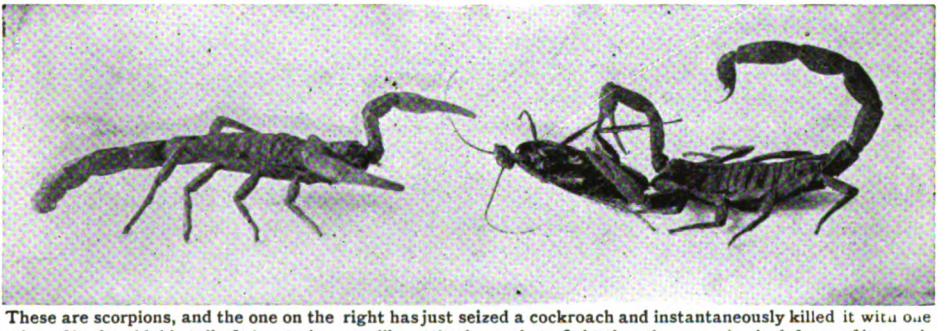
These remarkable photographs show three stages in the stalking of a fly by a marpessa spider, one of the largest of the northern jumping spiders, whose favourite haunt is the wooden palings of our gardens. The marpessa has keen sight, and is so cunning in hunting its prey that it hides behind every projection as it moves slowly towards its victim. At last, when it has come near enough, it gives one rapid jump, and the fly is caught.

The formidable bird-eating spider of South America is as large as a mouse, and its furred feet enable it to walk up glass. Its principal food is beetles.



The wolf-spiders of our gardens are hunters, not trappers, and their movements are very rapid. When pressed by an enemy, they leap away.

The tarantula of South Europe is a large spider that digs a burrow, where it hides for its prey. In winter it covers the opening with silk.



These are scorpions, and the one on the right has just seized a cockroach and instantaneously killed it with one sting of its formidable tail. It is now in a warlike attitude, ready to fight the other scorpion in defence of its meal.

Here is another of the dreaded tarantulas. The ignorant peasants of Italy believe that its poisonous bite causes madness, which brings on a dancing frenzy.

The largest and most dangerous scorpions, like the buthus, shown here, are found in tropical Africa and in India. They are sometimes nine inches long.

The water scorpion of our ponds is a creature that masquerades as a scorpion, but is not really a scorpion at all. Its tail is not a sting but only a breathing tube.

Another of these false scorpions is the chelifer, shown here. It is often found in old bee-hives, hen-roosts, and pigeon-houses, and under the bark of some trees.

by lifting all these separate pieces one foot at a time, the child can in the end easily raise this great weight. Each thread of the spider's web acts exactly like one of the rubber bands.

The garden spider makes her web in order that she may remain in comfort at home; but she has tiny relatives who use their silk for travelling. They send out their threads of silk as the garden spider sends out hers, but instead of waiting for the web to catch hold of some support, they float away on the little magic carpet of their own making. The wind catches up the light strands of silk, and away they go up into the air, with the spider comfortably swinging at the end. In this way the spiders often travel great distances, for they have been met far out at sea. Many of the webs, becoming drenched with moisture, descend upon trees and hedges; some are blown across paths, and, wet and heavy, catch our faces as we walk. On bright autumn mornings, as we motor along the country roads, the face of the driver and the front of the car catch scores of these webs. It is to be feared that the people in the car think only what a nuisance these little webs are, and never pause to reflect upon the wonder of them.

A SPIDER THAT DIGS A HOLE AND COVERS IT WITH A LID

The feats of our garden spider, wonderful as they are, seem commonplace when contrasted with the work of the trap-door spider. This creature is more common in hot countries than in others, but it exists in America, though it is not represented here by the largest species. By some naturalists it is called the mason spider, but its more common name is that which we give it here.

It makes a circular shaft in the earth about a foot deep, and from half an inch to one and a half inches wide. This shaft it first coats with a glazing material which makes it water-tight, and prevents particles of earth from falling in. Next, it lines the whole shaft with a covering of silk-like paper. Some of the tunnels have two tubes. The first tube descends in a straight line, and the second tube is made to branch off at a tangent, and to ascend, so that the two tubes are forked like a catapult. The door at the entrance to the shaft is, however, the greatest masterpiece of this spider's work. It is formed of layers of silk and earth, and exactly resembles its surroundings. The spider is so skilful in practising this deceit that it even glues pieces of earth and bits of dead leaves to the upper side of the door, so that it is quite impossible when the door is closed to discover it.

THE WONDERFUL DOOR OF THE SPIDER'S UNDERGROUND HOME

The hinge of the door is composed of strong silk, so that the trap can be pushed open quite easily from below. Should an enemy by some means find the trap-door, as it may by pursuing the spider to its home, the occupant, darting into the hole, pulls the door to with its claws and holds it tightly in position. It must be not uncommon for this to happen in some parts of the world, for there are spiders that are not content with one door; they have one door at the top of their shaft, and another, a smaller one, some few inches lower down.

The trap-door spider lives at the bottom of the tube. It must have very acute hearing, for it can detect the footfall of the lightest insect. Fancy our hearing an ant walking along the ground! The spider does, and out of its cell it dashes, seizes the insect, and drags it down into the shaft, where it sucks the juices which its body contains, then brings up the carcase and throws it well away from its home. Should any damage be done to its dwelling, the spider at once repairs it. By watching the spiders come out at night, naturalists have been able to discover these homes, and, to test the power of the spider, have removed the trap-door. It is proved that the spider can repair the damage five times, but no more. After the fifth destruction of its door, the spider gives up the struggle and goes away and hides, doubtless to await the time when it shall have accumulated a store of silk with which to renew work.

GREAT SPIDERS THAT CATCH BIRDS AND MICE IN THEIR WEBS

The strength of the webs woven by some of the tropical spiders far exceeds that of the webs which we know in this country. In the web of one, a mouse was caught. The spider increased its web, and actually succeeded, by adding new strands of considerable length, in raising the mouse four in hes—in the

same way, we may take it, that the child would raise the horses by means of elastic bands. We need not be surprised, therefore, that the webs of spiders like these are strong enough to catch birds. We must not, however, regard these as the real bird-catching spiders. That spider does not set snares to catch its prey. It makes a web, it is true, but this is in clefts of trees or between rocks, and here it hides all the day.

SPIDERS AS BIG AS RATS THAT CHILDREN LEAD ABOUT AS PETS

At night it comes forth, a fearful-looking monster, nearly as big as a rat. When its legs are outspread it occupies a surface nearly a foot in diameter. It can climb anywhere, for its feet are so padded with silk that it can easily run up a sheet of smooth glass set in an upright position. Its food consists for the most part of beetles and other insects, but it will eat any living thing which it can overpower. Thus it happens that when it finds a bird, the spider pounces on it, pins it down, and sucks its blood. This is the biggest of the spiders, and one of the most famous.

The strange thing is that children keep these spiders as pets. They tie a thread round what we may call the waist of the spider, so that it cannot get away, and lead it about as we in this country lead little dogs.

A very famous and dreadful spider is the tarantula, which was for a long time supposed to cause people the most extraordinary illness called "tarantism." Old-time doctors made a careful study of the matter, and decided that nothing but music could cure the sufferers; and books still exist advocating this mode of treatment, and actually giving the names of the pieces of music to be played for the relief of the victim. The tarantula really does give a bad bite, but the idea of its causing dancing madness, as the supposed ailment was called, is all nonsense.

THE WOLF-SPIDER THAT WILL LAY DOWN HER LIFE FOR HER CHILDREN

The tarantula is only a big wolf-spider, and wolf-spiders of various sorts and sizes are common in parts of the United States; as, for example, in Southern California. They are the spiders which race about in the summer among stones and grass. They do not spin webs to catch their prey, but depend upon the speed with which they can run. The mother wolf-spider may often be seen carrying with her the little packet in which her eggs are deposited. She is a brave and good mother, and will fight to the death to protect her little ones and her eggs. When the little spiders are born, she carries them about on her back, the babies fastening themselves on with strands of silk until they are big enough to run about and look after themselves.

The wolf-spider can get over the ground at a great rate, but not so rapidly as the hunting spiders which we may find in our gardens on a hot day. For the hunters not only run, but make great leaps, and so catch the fly or other insect that they desire to have. It is quite exciting to see them spring down a high wall, for it would seem as though, having no wings, they must fall headlong to the bottom. But they know better than that; they attach themselves to the starting point by a silken rope which runs out as long as they wish to descend, but stops when they reach the object for which they aimed. Then they can climb back by the aid of the rope, bearing their prey with them.

THE MARVELLOUS BALLOON OF A SPIDER AT THE BOTTOM OF A POND

One of the most interesting spiders may be seen in any quiet pond or ditch. The water-spider is, indeed, one of the marvels of the animal world. It is a creature which must breathe the air of the atmosphere to live, yet it is born under water, and passes all its days in or upon the water. It can run as easily and lightly upon the water as an ordinary creature can run on the land. Suddenly it dives into the water, and we see it darting down glistening with bubbles. And those bubbles explain the whole mystery. The water-spider is thickly covered with hairs and little bristles, and when it dives into the water, these carry air down with them, so that the skin of the spider is never wet.

But the most important thing is a big bubble of air which the female spider somehow manages to carry down secured between her hind legs. When she first goes down into the water she spins under the water a little dome-shaped cell of silk, with its opening downwards. Having made this, she ascends to the top of the water,

charges her whole body with air, and so arranges her hind legs that the big bubble of air cannot escape. This air she discharges into the nest which she has previously made. She makes several journeys up to the top of the pond, and each time descends and acts as before, until the air fills the cell and forces out the water. Thus she has a little palace of silk and air in the water secure from all her enemies. Here she makes her home and lays her eggs.

A SPIDER THAT BUILDS A RAFT AND PUTS HER EGGS IN A BAG

Another happy spider is the raft-spider. This one makes the neatest little raft of leaves, and on it floats about on the surface of the lake where she makes her home. If she sees a fly afar off, she darts from her raft and runs, light as air, upon the water. Should there be food down below, she trips nimbly down the stem of a plant growing in the water, and so reaches her meal. When she has laid her eggs she makes them up in a neat little silken bundle and carries this about with her. When the time draws near for the eggs to hatch, however, she fastens the cocoon to some plant growing near the edge of the water.

There are many more spiders in the world which afford interesting study. Some are fearful things, which can change the colour of their eyes at will, as the chameleon can change the colour of its skin. Some run sideways like a crab; some build nests on coral, which keep out the water when the tide rises; and these spiders live on fish. There are spiders pretty well everywhere. Their very existence is a sure evidence of a great number of insects, and that is a good answer to the question as to what purpose they serve in life.

THE MITES THAT ARE FOUND ON ANIMALS AND MITES THAT WE FIND IN CHEESE

In the same class as the spiders are the mites and ticks, tiny things that live, for the most part, as parasites upon other little animals. Some infest birds, some make the lives of sheep miserable, some are small enough to live upon the bodies of beetles and harvest-spiders. We need note only one, however, and that is the cheese-mite, which, however, as we shall soon see, is not a true mite at all. How do mites get into fine old Stilton, Gorgonzola, or other cheese? We know that the cheese in the making has undergone such a process that no living thing should be in it. Further, we know that life does not begin of itself anywhere. How, then, come the mites in our cheese at table? The explanation may surprise some people who think that a cheese is not prime and rich unless it has mites.

The mites are hatched from eggs laid by a nasty little fly which is related to the house-fly. The fly gets into the larder, or into the cheese-store, and selects a cheese which is cracked or broken upon the outside. In this crack it lays its eggs. These, when hatched, produce tiny maggots which we call mites, or hoppers, which in course of time will, if not destroyed, turn into flies. Hence the presence of mites in cheese is no testimony to the good quality of the cheese, but rather indicates that the cheese has not been as carefully treated as should have been the case—not kept as clean and safe from insects as clean people should have their food.

THE SAVAGE SCORPION'S STING THAT WILL MAKE A MAN ILL

In concluding, we turn from the smallest to the largest of the class to which this story is devoted, and we come at last to the scorpion. It is a hungry, savage creature, and serves a purpose by consuming an enormous number of harmful insects. The rest of its character is bad. Seemingly, the scorpion was a poisonous, bad-tempered creature when it was created; and its manners, like its form, have remained unchanged. The worst scorpions live in the hottest parts of Africa and in India. These reach a length of eight or nine inches, and their sting is so bad as to make even strong men very ill indeed. The scorpion's body is half tail. That tail, as it swiftly moves along, it carries in the air, raised over its back. When it grasps anything, down comes the tail, and from the end a sting protrudes, and a horrid poison is squirted into the wound which the sting causes. The poison serves to paralyse the insect seized by the enemy.

Scorpions may be very well as a check upon insects, but they get into beds and boots and other places where they should not be; and when the owner arrives they sting him without mercy.

The next stories of Nature are on page 3407.

HANSEL AND GRETHEL

CONTINUED FROM 3212

ONCE upon a time, near the borders of a dense forest, there dwelt a poor man who earned his living by cutting wood.

On his way home through the wood, one day, he found a poor little girl who had been carried away by a vulture, and left high up on the branch of a tree to die. He took the little girl home to his wife, and they called her Grethel, and brought her up with their only son, Hansel. But his wife died, and the wood-cutter married again. After a little while the wood-cutter became very poor indeed, and could hardly earn enough money to buy bread.

One night as they were lying awake, weak and restless from hunger, Hansel and Grethel heard their stepmother say to their father:

"In a few days we shall all die of hunger. If we had only ourselves to keep we might manage to live. I know what we must do. Early tomorrow morning we will take the children far into the forest and leave them there."

"No, wife," said the man. "How can I have the heart to leave my children all alone in the forest for the wild beasts to kill and devour?"

But the hard-hearted woman talked and talked until the poor man agreed.

Hearing this dreadful plan, Grethel wept bitterly. But Hansel, who deeply loved her, comforted her. "Do not cry, dear Grethel," said he; "I will find a way to get home safely."

He then got up quietly, crept out of the house, and filled his pockets with little white pebbles.

At sunrise their stepmother wakened Hansel and Grethel, saying, "Get up, children, for we are going into the forest to gather wood," and she gave them two slices of bread for their dinner. Grethel carried both pieces in her apron, as Hansel's pockets were full of pebbles.

As they went along, Hansel kept looking back, until at last his stepmother asked him sharply why he kept lingering and looking behind.

"I can see my little white cat sitting on the roof, and I am sure she is crying for me," said Hansel.

"You stupid!" she replied. "It is only the sun shining on the chimney-pot."

When they reached the middle of the wood their stepmother said:

"Run about and collect some twigs, and we will make a bonfire to keep us warm."

And Hansel and Grethel soon had a blazing bonfire of brushwood. Tired with their long walk, they fell asleep; but when they woke up it was dark, and they were quite alone. Grethel began to cry bitterly; but Hansel said:

"We shall be able to find our way home all right when the moon rises,

because I dropped a white pebble every time I looked behind this morning."

When they reached home they were scolded by their stepmother for straying away; but their father was ever so pleased to see them come back safely.

Not long afterwards, however, the same poverty came upon them, and the stepmother persuaded her husband to take the children much farther into the wood. The children again overheard the cruel scheme; but Hansel was unable to get a pocketful of stones because his mother had locked the door. He bravely lingered behind, however, and dropped crumbs from his piece of bread all the way along.

"Why do you lag behind so, Hansel?" said the woman.

"I am looking at my little dove sitting on the roof wanting to say good-bye to me," replied Hansel.

"You silly boy!" said she. "It is only the morning sun shining on the housetop."

Their mother left them asleep just as before, and when Grethel said, "What are we to do, Hansel, dear, for the night is coming on and we are much farther in the forest than we were last?" Hansel replied, "Do not fear, dear Grethel; I have left all my bread in little crumbs on the wayside."

Grethel then dried her eyes and shared her piece of bread with Hansel. When the moon rose they started off; but, to their alarm, they found that there were no crumbs to be seen, as the birds had eaten them all up. They wandered about the forest all through the night and the next day, having only berries to eat; but they could not find their way home, so they laid themselves down and went to sleep.

About noon the next day they saw a lovely snow-white bird sitting on a branch, and singing so beautifully that they listened to it for a long while. When it had finished singing it flew slowly away, looking round at them as if inviting the children to follow. This Hansel and Grethel did, and after a little while the bird perched on the roof of a tiny house.

To their surprise they found that the walls of this little house were made of gingerbread, the roof of cake, and the windows of barley sugar.

"Oh! Something to eat at last!" cried the hungry Hansel. "Here is a lovely piece of barley sugar for you, Grethel." And the two children pulled pieces of gingerbread off the walls, and ate to their heart's content. Suddenly a voice came from within:

"Munching, crunching, munching,
Who is eating up my house?"

And the children answered:

"The wind, the wind,
'Tis only the wind!"

and went on eating hungrily.

In a minute or two the door opened, and a little old woman hobbled out.

"Poor little children," said she. "How tired and hungry you look! Come in with me, and I will give you plenty to eat and drink."

The children followed her in, and had a meal of milk and pancakes, and apples and nuts. And then she put them into two pretty little beds, and they fell asleep and dreamt they were in heaven.

Now, the old woman was really a witch, who built this gingerbread house to attract children, so that she could capture them and eat them. So when Hansel was asleep she took hold of him and quickly shut him up in an iron cage. She then shook Grethel, and said:

"Get up, lazy bones, and help me get water and cook some food, for I am going to fatten your brother and eat him."

After breakfast the old woman went out. Grethel immediately ran and told Hansel all the old woman had said.

"The old woman must be a bad fairy," said Hansel. "Search for her magic wand and pipe, and then help me out of this cage."

So Grethel found the wand and pipe, and they ran away together. After some time the old fairy came back, and was very angry to find that Hansel and Grethel had escaped her. So she put on her seven-leagued boots, and quickly caught up the children.

As soon as she saw the bad fairy, however, Grethel waved the magic wand, changed herself into a lake, and Hansel into a swan floating on it.

The fairy tried hard to entice the swan to the shore by offering him crumbs of bread and cake, but he would not move, so she gave it up and went home in disgust for the night. Grethel then changed Hansel and herself back into their proper forms, and

THE WITCH OF THE GINGERBREAD HOUSE

When Hansel and Grethel were lost in the forest they came upon a wonderful house made of gingerbread, with a roof of cake and windows of barley sugar. They were so hungry that they immediately broke off a piece of barley sugar and began to eat it. Suddenly, to their amazement, an old witch appeared and invited them in.

on they went. Next day they perceived the fairy overtaking them again. This time Grethel changed herself into a rose in a prickly hedge, and Hansel sat on a mossy bank beside it and waited.

The fairy soon came up and mounted the bank to pick the rose which she knew must be Grethel. Hansel quickly put the pipe to his mouth and began to play. Now, as it was a fairy pipe, everyone who heard its music had to dance, even the old fairy, and there she capered and jigged, getting fixed firmly into the hedge, where the sharp thorns tore her clothes off and pricked her skin.

Grethel freed herself once more and they went on again, but became very weary, so Grethel decided to turn herself into a daisy while Hansel tried to find the way home alone. But Hansel got lost and did not return.

One day a shepherd spied the daisy, and picked it, saying: "I will take this little flower home with me; it is the prettiest daisy I have ever seen."

So he took it home and placed it in a box, and from that day everything flourished wonderfully in his house. All the work was done, the fire made and the water fetched, before he got up. He could not make this out, so he went to a wise woman, and she said:

"It must be witchcraft. Get up early to-morrow morning and throw a white cloth over anything that moves."

So he got up early and saw the box open and the daisy come out. He at once threw a white cloth over it, and the beautiful Grethel stood before him. She told him her troubles, and said:

"I will stay with you until Hansel comes back."

A long while passed and Hansel came back. Hansel and Grethel once more started for home, but getting tired they went to sleep in an old hollow tree.

In the morning when they awoke, the sun had risen high above the trees, and it was very hot. Little Hansel said:

"Sister, I am very thirsty; if I could find a brook I would go and drink, and fetch you some water too. Listen! I think I hear the sound of one."

Then Hansel rose up and took Grethel by the hand and went in search of the brook. But the fairy had found out all that had happened and intended to do them harm; and when they had found a brook that ran sparkling over the pebbles, Hansel wanted to drink; but Grethel thought she heard the brook, as it babbled along, say: "Whoever drinks here will be turned into a tiger." Then she cried out:

"Ah, brother, do not drink, or you will be turned into a wild beast and tear me to pieces!"

"I will wait," said Hansel, "for the next brook."

But when they came to the next, Grethel listened again, and thought she heard: "Whoever drinks here will become a wolf." Then she cried:

"Brother, brother, do not drink, or you will become a wolf and eat me!"

So he did not drink, but said:

"I will wait for the next brook; there I must drink, say what you will, for I am so thirsty."

As they came to the third brook, Grethel listened, and heard: "Whoever drinks here will become a fawn."

"Ah, brother," said she, "do not drink, or you will be turned into a fawn and run away from me!"

But Hansel had already stooped down upon his knees, and the moment he put his lips into the water he was turned into a fawn.

Grethel wept bitterly over the poor creature, and the tears, too, rolled down his eyes as he laid himself beside her. Then she said:

"Rest in peace, dear fawn; I will never leave you."

So she took off her golden necklace, and put it round his neck, and plucked some rushes and plaited them into a soft string to fasten it, and led the poor little thing by her side farther into the wood.

After they had travelled a long way, they came at last to a little cottage; and Grethel, having looked in and seen that it was quite empty, thought to herself, "We can stay and live here." Then she went and gathered leaves and moss to make a soft bed for the fawn, and every morning she went out and plucked nuts, roots, and berries for herself, and sweet shrubs and tender grass for her companion; and it ate out of her hand, and was pleased, and played and frisked about her. In the evening, when Grethel was tired and had said her prayers, she laid her head upon the fawn for a pillow, and slept. They lived thus a long while in the

wood by themselves, till it chanced that the king of that country came to hold a great hunt there. And when the fawn heard all around the echoing of the horns, and the baying of the dogs, and the merry shouts of the huntsmen, he wished very much to go to see what was going on.

"Ah, sister," said he, "let me go out into the wood. I can stay no longer!"

And he begged so long that at last she agreed to let him go.

"But," said she, "be sure to come to me in the evening. I shall shut up the door to keep out those wild huntsmen; and if you tap at it, and say, 'Sister, let me in,' I shall know you; but if you don't speak, I shall keep the door fast."

THEY WENT TO SLEEP IN AN OLD HOLLOW TREE

Then away sprang the fawn, and frisked and bounded along in the open air. The king and his huntsmen saw the beautiful creature, and followed, but could not overtake him; for when they thought they were sure of their prize, he sprang over the bushes, and was out of sight in a moment.

As it grew dark he came running home to the hut, and tapped, and said: "Sister, sister, let me in." Then she opened the little door, and in he jumped, and slept soundly all night on his soft bed.

Next morning the hunt began again; and when he heard the huntsmen's horns, he said:

"Sister, open the door for me, I must go again."

Then she let him out, and said:

"Come back in the evening, and remember what you are to say."

When the king and the huntsmen saw the fawn with the golden collar again, they gave him chase; but he was too quick for them.

The chase lasted the whole day; but at last the huntsmen nearly surrounded him, and one of them wounded him in the foot, so that he became sadly lame and could hardly crawl home. The man who had wounded him followed close behind, and hid himself, and heard the little fawn say: "Sister, sister, let me in." Upon which the door opened, and soon shut again. The huntsman marked all well, and went to the king and told him what he had seen and heard; then the king said:

"To-morrow we will have another chase."

Grethel was very much frightened when she saw that her dear little fawn was wounded; but she washed the blood away and put some healing herbs on it, and said:

"Now go to bed, dear fawn, and you will soon be well again."

The wound was so small that in the morning there was nothing to be seen of it, and when the horn blew, the little creature said:

"I can't stay here; I must go to look on. I will take care that none of them shall catch me."

But Grethel said: "I am sure they will kill you this time; I will not let you go."

"I shall die," answered he, "if you keep me here. When I hear the horns, I feel as if I could fly."

Then Grethel was forced to let him go; so she opened the door with a heavy heart, and he bounded out gaily into the wood.

When the king saw him, he said to his huntsman:

"Now chase him all day long till you catch him; but let none of you do him any harm."

The sun set, however, without their being able to overtake him, and the king called away the huntsmen, and said to the one who had watched the fawn:

"Now come and show me the hut."
So they tapped the door, and said:
"Sister, sister, let me in."

Then the door opened, and the king went in, and there stood a maiden more lovely than any he had ever seen. Grethel was frightened to see that it was not her fawn but a king with a golden crown. However, he spoke kindly, and took her hand, and said:

"Will you come with me to my castle and be my wife?"

"Yes," said the maiden. "But if I come my fawn must go with me."

"Well," said the king, "he shall come and live with you, and want for nothing."

Just at that moment in sprang the little fawn, and his sister tied the string to his neck, and they left the hut.

Then the king took Grethel to his palace, and celebrated the marriage in great state. And she told the king all her story; and he sent for the fairy and punished her. And the fawn was changed into Hansel again, and he and his sister loved one another, and lived happily together all their days.

THE FABLES OF ÆSOP THE SLAVE

THE VILLAGER AND THE VIPER

ONE cold winter's day a villager found a viper under a hedge almost dead with cold. The man had pity on the poor creature, and so he brought it home and placed it on the rug in front of a warm fire. After it had been there some time the warmth revived it, and it at once began to hiss and to threaten to bite the children.

The villager heard his children crying out, and running in he caught up a stick and killed the viper, saying, "Is this the way you reward those who try to save your life?"

People who are not grateful for kindnesses are unlikely to receive any more.

THE FOX AND THE GOAT

A FOX one day happened to fall into a well, and could not get out again. Some hours afterwards a goat came to the place, and, wanting to drink, asked the fox if the water was good.

"It is so very good and sweet," said the fox, "that I have drunk so much that I am afraid I shall be ill."

Upon this the goat, without any more hesitation, jumped into the well to drink the water. The fox at once sprang on her back, and so was able to leap out, leaving the poor goat in the well to get out as she could.

Be careful how you take the advice of people whom you do not know.

THE BOY WHO CRIED "WOLF!"

THERE was once a shepherd's boy who minded a flock of sheep in the fields. As a mere joke he would often shout out: "Wolf! Wolf!" This caused the men working in the neighbouring fields to run to the rescue, but after being thus deceived two or three times, they decided to take no notice of his shouts.

Soon afterwards a wolf really came, and the shepherd's boy cried out in earnest. But no one took any notice of his shouts, and so his sheep were killed by the wolf.

If we tell untruths, no one will believe us, even when we speak the truth.

JUPITER AND THE ASS

AN ass which belonged to a gardener, and was tired of carrying a load of cabbages to market every day, prayed to the god Jupiter to give him a new master. Jupiter agreed to, and gave him a tilemaker, who sent him every day to market with a heavy load of tiles.

The poor donkey found that his work was harder than ever, so he again asked the god to give him a change. This time Jupiter gave him to a tanner, who treated him more hardly and cruelly than either of his former masters.

When it was too late the ass wished that he had stayed with his first master.

Be contented with your lot.

THE FOX AND THE LION

THE first time that a fox saw a lion and heard his terrible roar he was so frightened that he lay trembling on the ground and almost died with fear.

The next time he met the king of beasts he was not so frightened, but ventured to look timidly at him. The third time that the two animals met the fox had lost all his fear, and came coolly up to the lion and entered into conversation with him as if he had been an old friend.

Familiarity breeds contempt.

THE PASSING OF KING ARTHUR

AND THE BREAK-UP OF THE TABLE ROUND

MANY other stories of King Arthur's knights are there, and these you may read in books; but here we have room left only to tell the end of the Round Table. For this gracious Order of Chivalry, which was like a parliament ruling Britain in a goodly manner, so that no man dare play the tyrant and none oppress the poor and the weak, came to an end, and the unwitting cause of it was Queen Guinevere, the loveliest lady in Christendom.

For this beautiful lady could not keep her thoughts from dwelling much on Sir Lancelot of the Lake, who was the handsomest, the strongest, and the most courteous of all King Arthur's knights, and Arthur loved him as a brother. And so great was Arthur's love that when evil men, who hated Lancelot, tried to make him think that Guinevere loved the knight more than the king, Arthur was very wroth. But these evil men bided their hour, and one day, when Lancelot was alone with the queen, they came in a great number and made an uproar at the door of the queen's chamber, crying "Treason! Treason!" So Lancelot, after slaying many of them, had to flee, and Guinevere—against the king's will—was tried for treason, and was ordered to be burned as a traitor to the king.

But as she stood bound to the stake, and the flames began to rise around her, Lancelot rode up, slew those about her and before her, and carried her off. He had saved her, but she could not be his, for Lancelot loved honour. So he took her to an abbey, where she gave up all her life to prayer and holiness, and there the greatest knight of Christendom parted from the lovely queen. After that Lancelot retired to Gaul.

QUEEN GUINEVERE IN THE ABBEY GARDEN AT MALMESBURY

This picture is reproduced by permission of the artist, Mrs. Mary F. Raphael, who also painted the beautiful picture given on page 686.

Then the brother of one whom Lancelot had slain forced the heart-broken Arthur against his will to make war on Lancelot. And they fought in Gaul, and Lancelot gave orders that none should hurt the king, and as often as he saw Arthur dismounted he himself went to his rescue. Many times in the midst of this fierce battle the two great men looked into each other's eyes, and exchanged words of love and courtesy.

Afterwards Arthur returned to Britain, for his kingdom was in an evil state, and there was a great war in the West. The story of Lancelot and the queen had been a poison in the land,

and men forgot honour and courtesy, and had become like beasts. It seemed as if all the king's noble work was undone. The ideals of kindness and chivalry which had given peace, glory, and virtue to the land, were now mocked at as make-believes and foolish notions. The strong trampled the weak. Few cared about honour. There was none to help the weak and oppressed. Sad and heart-broken was King Arthur, who had lost his queen, his favourite knight, and now his kingdom; but he fought in the West boldly for Christ and righteousness, as one who would never surrender; and there was he wounded to the death.

Now, when he was wounded, he called upon Sir Bedivere to carry him to a little church by the seashore; and Sir Bedivere wept, but Arthur comforted him. Then said the king:

"Take now my sword, Excalibur, and hasten thee to the side of the water, and fling it into the deep." And Sir Bedivere went away. But the beauty and fame of the sword tempted him, so that he hid it, and returned to the king with a lie. But the king knew that he lied, and sent him a second time. Yet a second time did Sir Bedivere lie, and the king sent him a third time. Then Sir Bedivere returned, and the king asked:

"What sawest thou?"

"I saw," answered Sir Bedivere, "a hand rise from the water, and as the sword hurtled towards the waves the hand caught it by the hilt, and brandished it thrice in the air, and afterwards drew it down under the water."

"It is well," said the king.

Then he commanded Bedivere to carry him to the water's edge, "Where the lapping waves floated many an empty helmet and the fitful moonlight fell on the upturned faces of the dead."

And as they reached the shore a great barge came to them, wherein were three queens, all in black with crowns upon their heads. And the queens received the king into the barge, and one took his head upon her lap, and another chafed his hands, and the third bowed at his feet, while the barge drew slowly away across the darkening sea.

And the last words of King Arthur came across the waters to Sir Bedivere, as he was kneeling on the shore: "Pray for me."

LADY AGNES OF ST. DUNSTAN'S TOWER

MUCHELNEY is a pretty little village of old-fashioned houses and apple orchards, lying amid the ruins of an abbey, in the marshlands of Somerset.

In the fifteenth century, one of the village lads fell in love with Lady Agnes, of St. Dunstan's Tower, and the two lovers stole away to a priest and were married.

But just as they were leaving the church, Lady Agnes's brothers arrived. Some of them seized the bride and carried her away, and the others attacked the bridegroom; and, thinking they had killed him, they took him into the Muchelney Abbey to die. But he recovered, and after vainly seeking about England for his wife, he returned to Muchelney Abbey, and became a monk, and soon rose to the position of abbot.

One evening, a woman, veiled like a nun, came to Muchelney and asked to see him. She was led into the abbot's chambers, and when they were alone she unveiled her face. He was surprised to see that she was Lady Agnes! At first the abbot did not know what to do. He was afraid lest the brothers of Lady Agnes should miss her and track her to the abbey, and once more carry her away from him. Now that she had found her way back to him, he vowed that nothing in this world but death should ever again separate them.

The abbot at once hid her in a secret recess in his chamber, and asked her to wait there until he had got everything ready for them to fly away together to some place where their story would not be known. He collected some money and saddled a pair of horses, and then opened the recess, saying: "Dearest, we can now depart."

But there was no answer. Opening the door of the recess, he gave a loud cry. His wife was lying on the floor, dead. And twining his arms about her body, he, too, died. The abbot's house, where all this happened, is still standing to-day, but it is now used as an ordinary farmhouse.

LEGENDS OF THE STARS

In the early ages shepherds tending their sheep and goats, huntsmen pursuing the hare, the bear, the wolf, and the lion, sailors on the wide sea meeting whales and sea monsters, or seeking fish, fancied that they could make out pictures in the groups of stars. They invented stories about them and about wonderfully strong and beautiful beings, gods and goddesses, who were more than human, living high up there in the sky. Here are a few of these legends telling of the star-pictures beginning on page 2611.

AN INDIAN LEGEND

ACCORDING to an Indian legend from California, the sun, moon, and stars are one big family. The sun is the great chief and ruler of the heavens; the moon is his wife, and the stars are his children, whom he has to eat to keep himself alive when he can catch them. But when he is up in the morning, they flee out of his sight as fast as they can, and dare not appear again until he goes into his hole in the west. He crawls along this hole till he comes to his narrow bed in the middle of the earth. This is so small that it does not give him room to turn round; so when he wakes up next day he has to creep out to the east. Then his wife, the moon, takes her rest.

Every month she grieves when he eats up some of the stars, and puts black over her gentle face to show her sorrow. This gradually wears off, till by the end of the month her face is bright again. The stars are happy with their mother, the moon, and sing and dance as she passes among them. After a time other star children disappear, and she has to put on mourning again for them.

ORION, THE BELTED GIANT

ORION was a giant who wanted to marry Hero, or Merope, daughter of Ænopion, King of Chios; but this king, who took a dislike to the suitor because of his great height, thinking to rid himself of a troublesome person, consented to the marriage only on condition that Orion freed the island of Chios from the beasts that raged there. This he did, but King Ænopion failed to keep his promise, and had him blinded. Then Orion was directed by a blacksmith, whom he carried on his back, to the best spot for facing the rising sun. Gazing at it, Orion recovered his sight.

According to one legend, Diana, through jealousy, slew him with her arrows; according to another, his death was due to the bite of a scorpion which rose from the ground to punish him for boasting of his prowess as a hunter. He was carried to the heavens, and there shines as a constellation of seventeen stars, with a glittering belt round his waist and his dog Sirius near him. He is found near the feet of the Bull, and is sometimes shown with a club or a sword in his hand, and bearing a shield. One of the stories about him is that he piled up a bank on the coast of Sicily to keep out the sea; another, that he was a worker in iron, and made a palace for Vulcan, underground.

THE GREAT DOG

NEAR Orion, between the Hare and the Milky Way, as far south as we in the Northern Hemisphere can see, lies the Great Dog of Orion, containing one very brilliant star called Sirius. It used to be regarded as a warning by the Egyptians, just as a good watch-dog warns a house of coming danger. The dog in the sky could not bark, but its bright light let the Egyptians know of any harmful event about to happen.

When they saw the star in the early morning they knew the Nile would soon overflow. So one name they gave it was the Nile star. Of course, they knew nothing of the real sources of the Nile then, because no one had found them out. Sometimes, to show what it was necessary to do on its appearance, they pictured the dog as a man with a dog's head, a stew-pot in his arms, a feather under one arm, wings to his feet, and leaving behind him a duck and a tortoise. The Greeks and Romans associated the Dog star with the heat of summer, and said that it burnt up the fields and killed the bees. We still talk of the dog days in the hottest season.

A FAMILY GROUP

THERE are four constellations in the sky standing for quite a family group. Cassiopeia, the mother; Cepheus, the father; Andromeda, the daughter; and Perseus, the son-in-law, with, a little further off, Pegasus, his winged horse. Cassiopeia foolishly declared herself to be more beautiful than the

Nereides, and the angry nymphs, in revenge, got Neptune to send a sea-monster to trouble Æthiopia, or Topa, where Cassiopeia lived, for she had married King Cepheus of that country. The story of Andromeda's exposure to the monster, and her rescue by Perseus is told elsewhere. Cepheus, the husband of Cassiopeia, sailed with the famous Argonauts.

Cassiopeia was pictured by the ancients in a southern constellation of thirteen stars, seated on her throne, and holding a palm-leaf in her hand. Cepheus is near here. Cassiopeia, as the constellation is called, can be recognised very easily in the sky in the form of an "m," or, as some see it better, a "w."

THE GREAT BEAR

LOOKING at this group of stars, so easily observed, for they never set in the Northern Hemisphere, people fancied they saw in them different objects. So the Greeks said: "It is a chariot"; the ancient Gauls called it "Arthur's Chariot"; the Americans, "The Dipper"; the English, "Charles's Wain" or "The Great Bear." There are two bears really, a Great Bear, or Ursa Major, and a Little Bear, or Ursa Minor. This is the legend of how they came there.

Jupiter and Calisto had a son named Arcas. Juno, who was jealous of Calisto, changed her into a bear, and her son by mischance was on the point of killing her. Jupiter, recognising her danger from huntsmen, changed her into a constellation. Arcas' kingdom was Arcadia, a happy land, where people were taught by their king to till the ground and spin wool. One day while hunting, he met a beautiful wood-nymph in trouble because the tree over which she watched was in danger from a river in flood. Arcas saved the tree by turning aside the current; then he married the nymph, and when he died left his kingdom to his three sons. Jupiter at his death turned him into a bear like his mother, so that he has since kept her company as a constellation.

THE PLEIADES

THESE seven stars were associated with seven beautiful sisters, daughters of Atlas, and named Electra, Maia, Alcyone, Taycete, Celæno, Merope and Sterope. They all married gods, except Merope, whose light is less bright because she was wedded to a mortal, Sisyphus, King of Corinth. Electra's light also diminished through grief after the fall of Troy, which her son Dardanus had founded.

The word Pleiades comes from a Greek word meaning "to sail," because this constellation shines well in spring, at a good time for sailors to start on a voyage. Because, too, of their association with Ver, the spring, these stars are also called the Virgiliæ. From the earliest times, festivals and seasons were connected with the rising of the Pleiades.

The story runs that, in Bœotia, the giant Orion went in pursuit of the seven sisters, but they prayed to be saved from him, and they were changed into the form of doves. Now they are ever at a safe distance from him in the skies, at the back of the Bull, and behind its protecting horns, where Orion cannot trouble them.

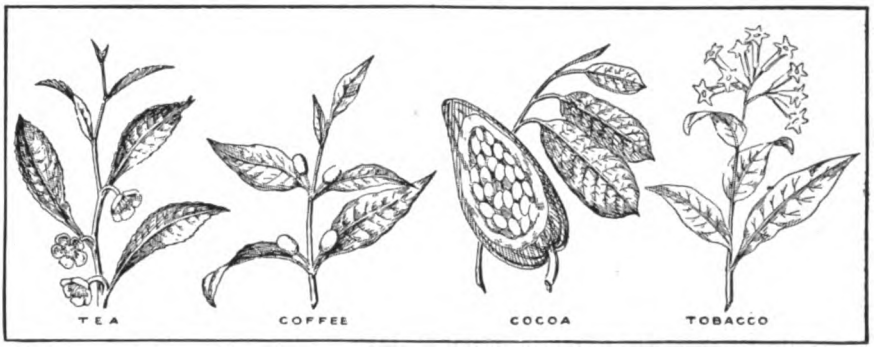
HERCULES WITH HIS CLUB

THE celebrated hero Hercules, son of Jupiter, was, of course, bound to be enthroned among the gods in the skies, so the Greeks gave him a place of honour, with his club in his right hand, an apple-branch in his left, in memory of the apples of the Hesperides, and in a kneeling position, with the lyre near his feet.

The legend is that Hercules was fighting one day with stones, but had used them all up. Then Jupiter, seeing the danger of his son, rained down a shower of round stones. These Hercules bent down to pick up, and throw at his enemies, and thus overcame them. This is why he is shown kneeling.

Many are the stories of his prowess and marvellous physical strength, but the most wonderful were his twelve labours, on the performance of which the Delphic oracle promised him immortality. These included slaying the Nemean lion, the Hydra, or water-snake, and the monster birds; capturing a stag with hoofs of bronze and antlers of gold, the boar of Erymanthus, the mad Cretan bull, the mares of Diomedes, Geryon's oxen, and Cerberus, the dog of hell; securing Hippolyte's girdle and the golden apples of the Hesperides. By his own will his body was burned on a pyre, and his spirit passed away in a cloud to Olympus, where he married the goddess Hebe, and became immortal.

THE NEXT STORIES ARE ON PAGE 3500



TEA, COFFEE, AND TOBACCO

CONTINUED FROM 3217

We must now discuss a number of substances which are very largely used, but which we cannot call foods because we do not find that they add any power to the body or make any of its tissues. If these things did nothing, they would not be worth mentioning; but though they are not foods, they have a very real action upon the body, and there are few people who do not take one or other of them every day. We ought to understand their action.

First we must just mention, and briefly dismiss, the things called condiments. Literally, this means *the things given with*; and the things that we give ourselves along with our food, and call condiments, are salt, pepper, mustard, vinegar, and so on. Of these, the first happens to be a condiment, as we say, because it has a very decided taste; but we have already learnt that it is an absolutely necessary food, without which we must die. But all the other condiments are quite different. They have no food-value of any kind; they may be actually injurious by irritating the coat of the stomach.

Th s is very rare, but it may happen when a person becomes, for instance, too fond of vinegar. We take these things not only for their own flavour, which we really do not care much about in itself, but because they act on the nerves of the mouth and tongue and nose so as to sharpen the taste and flavour of our food. If our appetite is poor, this is of service to us. Also, these things have a marked effect in persuading the stomach to produce its juices, and, if the stomach is not producing enough, that is also of good service to us. On the other hand, a great many people eat far more than is good for them, and the last thing on earth that they ought to add to their food is anything that tempts them to eat more.

No condiment of any kind, except, of course, salt, as we understand, is good for children. Children have good appetites and good digestions, and condiments should be saved up for the time when they have neither. That time is less likely to come at all if the healthy development of the organs of digestion has not been interfered with by adding unnatural things to the food. As we shall see, this remark about condiments, which is agreed upon by everybody who has studied the food of children, applies also practically to all the other things that have to be discussed in this part of our story.

All over the civilised world people drink enormous quantities of tea or coffee, or else of drinks made from other plants that really contain the same thing for the sake of which we take tea and coffee. Of course, tea and coffee have very different tastes, and that

difference must be due to something. Certain volatile oils occur in the tea-plant which are quite different from those in the coffee-plant. These oils have a very pleasant taste and flavour, but they are not very important in their action on the body. The thing that really gives tea and coffee their attraction is the same substance in both of them, and it exists in several other plants. It is sometimes called *theine*, and sometimes *caffeine*. This is a wonderful substance, and, so far as we know, there is nothing else like it in the world. It is the only true stimulant of the brain that has yet been discovered. Other things, such as alcohol, will appear to stimulate the brain, but that is only appearance, as we shall see. Caffeine, however, really makes the brain work better, it produces no reaction afterwards, and just because it is the only true stimulant of the brain, it is the only drug we know which, by its pure action on the brain, will keep people awake.

THE STIMULATING DRUG THAT HELPS THE STUDENT TO KEEP AWAKE AT NIGHT

Medical students working for examinations sometimes take not merely tea or coffee but pure caffeine itself, which is a bitter-tasting white powder; and swallow large doses of it at night in preparing for an examination. I do not say that this is a wise thing to do, but it will keep one awake, it will enable a man to read and work hard for hours when, without it, he could not possibly have kept his eyes open, and the only result that appears to follow after a long time is that the drug becomes rather less effective.

All this is not to say that we may not hurt ourselves with tea and coffee, because we often do. For one thing, people who are not working for an examination, and whose difficulty is not to keep awake, but to get to sleep, hurt themselves by taking these things. Bad sleepers ought either to make it a rule to take no tea or coffee after five o'clock, or after midday, or, better still, to go without altogether.

Then, again, many people hurt themselves with tea not because the caffeine does them any harm, but because the tea-leaf contains a great deal of a curious substance called tannic acid, or tannin, which is bad for the digestion. If we put a little pure tannin into the mouth, we can feel at once how it dries the mouth up, and it does the same in the case of the stomach. This means that the digestive juices cannot be properly produced. If we allow for the possible interference with sleep, and for the interference with digestion, we account for the whole of the bad effects that may follow the frequent taking of tea.

THE RIGHT AND THE WRONG WAYS OF MAKING TEA

China tea contains less tannin than other tea; but the really important thing is the way in which tea is made. Careful experiment has shown that in about three minutes boiling water will extract practically all the caffeine in the tea-leaf, together with plenty of flavouring matter. In this period of time very little tannin is extracted. If we go on infusing after this, we get nothing more that is pleasant or useful, but we do get far more tannin; more and more indeed gets into the water for as long as three-quarters of an hour, and there is far more after five minutes than after three. It is very wrong to boil or stew tea. It should be infused, which means that the boiling water should be poured upon it; and it should not be infused a moment longer than four minutes at the outside. The Chinese, to whom we really owe tea, say that the best water for making it with is that from a running stream, and the worst is well-water. The reason is that one should use water which has plenty of gases in it. If we allow the kettle to go on boiling, we drive off these gases, and make the water flat, and spoil the tea. We should use the water directly the kettle has come to the boil.

THE WAY TO GET THE BEST VALUE INTO A CUP OF TEA

If we have to use water which is flat to begin with, we should pour it from a height, from one jug to another, so that it can take up some of the gases from the air. If the water is hard, a pinch of baking-soda should be added to the teapot. Tea-tasters use a smaller proportion of tea than most of us do. The teapot should be thoroughly hot, for if the water falls much below the boiling point while the infusion is going on, some of the things in the leaves which give the tea its best flavour do not get into the water. We should never make a second brew, for it is

certain that the first brew takes away from the leaves everything worth having. Anyone who cares to attend to these rules about the making of tea will get a far more delicious drink from cheap tea than can be got from tea costing twice as much, but wrongly made.

Let us remember, too, that properly made tea is very nearly the most innocent drink in the world, and in many respects, and for most people, is actually beneficial. In our country we drink about four million gallons of tea every day, and the very small amount of ill-effect that can fairly be put down to this gigantic consumption is due to the fact that many people are so careless in the way they go about it.

So far as caffeine is concerned, coffee and tea do not differ very much—that is to say, coffee made with milk contains about a grain of caffeine to the cupful, and the rate in tea is about the same. But, of course, if we drink strong black coffee we swallow a good many grains of caffeine every day. There is a special and powerful volatile oil in coffee which upsets some people, so that they cannot drink coffee, though they can drink tea.

THE HARM THAT COMES OF BAD TEA AND BAD COFFEE

Our commonest mistake in making coffee is that we make it too weak. The berries should be freshly roasted, neither too much nor too little, and they should be ground just before they are used. The same rules apply to the water as in the case of tea. Metal apparatus, especially if it is complicated, is bad. It is often difficult to clean, and then the stale coffee spoils the new brew. If the coffee is allowed to stand for a little, there is no need to filter it. A simple earthenware vessel is the best. If anyone finds that he is not sleeping as he ought to do, and if he is a coffee-drinker, that is the very first thing that he should cut down.

Though black coffee is decidedly stronger than tea, it is very much less injurious—if injurious at all—than improperly made tea. Hundreds and thousands of girls ruin their digestion by taking tea from a kettle kept on the fire all day; but it is the tannin and not the caffeine that is to blame. There is not much tannin in the coffee bean.

No child should take tea or coffee. I do not say that older children are necessarily hurt by occasionally taking a little very weak tea, but they are safer without it. The bright, active brain of a child always "on the go" has no need to be stimulated; and these things are only stimulants, not foods. Also, in encouraging children to take these things, we interfere with their contentment in taking really important things like milk. Again, many a child who has tea late in the day is found to be excited and unsleepy at night, and the tea is the real reason.

WHY CHILDREN MAY DRINK COCOA FREELY WITHOUT HARM

Cocoa differs from tea and coffee in one or two important ways. It also contains a substance which is closely related to caffeine; but it is so weak a stimulant that it is not worth mentioning, and therefore we may freely permit children to drink cocoa, though we forbid them tea and coffee. This is a very important point, because children like hot things, and hot drinks are often very good for them; and if we flavour hot milk with cocoa, we can persuade them to take it better. It is wonderful how much milk and sugar we can get inside a child with the help of a substance like cocoa.

Many people suppose that cocoa itself is a useful food; but, as a matter of fact, we do not use much cocoa in the cup, and what there is is quite unimportant as a food. The fat in cocoa, which is useful in its small degree, is often apt to upset the digestion, and so many children will not touch cocoa. It is worth knowing that different kinds of cocoa differ a good deal in the way they are made, and the child who refuses to take one kind will perhaps quite readily take another which may, for instance, contain less fat of the bean.

CHILDREN MAY EAT CHOCOLATE FREELY IF THEIR TEETH ARE PROPERLY CARED FOR

To praise cocoa is to praise chocolate, which is a splendid food. When we take chocolate, we are not merely taking solid cocoa, with such food-value as it has, but we are also taking a very large quantity of sugar. The soldiers, when fighting in South Africa, learnt how pleasant and how sustaining chocolate is. Most children love chocolate, and are quite right, too. The plain chocolate, which is cheaper, is really better

for children, both as a food and for other reasons, than cream and fancy chocolate bonbons. We often notice that some children are wise enough to prefer plain chocolate to the elaborate and fancy things which tempt their elders. If children's teeth are properly used and properly cared for, the sugar of chocolate need not be feared. Far the finest teeth in the world among human beings belong to negroes, who very nearly live on sugar-cane.

ALCOHOL AND TOBACCO ARE NOT FOODS, BUT POISONS

We have already learnt that we are bound to study from the food point of view everything that enters the body, whether it be what we usually call a food, or whether it be a gas, such as the air which we breathe. Many of us are in the habit of taking into our bodies various substances which are not foods, but which we take as if they were foods, and which we certainly ought to understand. The most important of these things are tobacco and alcohol.

Nowadays there are a good many others which a certain number of people take, but we need not discuss them, especially as what is true of tobacco and alcohol is largely true of them. These substances are both poisons; in other words, a sufficiently large dose of them—the exact amount depending upon the weight and age of the particular person, on whether he has taken the drug before, and so forth—will kill. That the smoke of tobacco is a poison no one questions, though a great many people who know nothing about the subject question whether alcohol is a poison. They think it is absurd to call alcohol a poison, because many take it daily without being killed.

THE POISON THAT WILL KILL AND THE POISON THAT WILL NOT KILL

But for every poison in the world there is a dose that will kill and a dose that will not. This is true, for instance, of the carbonic acid in the air we breathe. Carbonic acid is a poison, but it will not kill except in the poisonous dose. In lesser doses it merely injures, or else the body resists it altogether, and is not hurt. But when the body has to do this with anything that threatens it, it has to pay a fair price. Tobacco is the leaf of a plant, and this leaf contains various substances, including a special one called *nicotine*, which, when given by itself, is intensely poisonous. It seems to be true of both nicotine and alcohol that they are poisons in their degree to every form of life. A third of a grain of nicotine has killed a man. People who take tobacco may smoke it, or they may chew it, or they may grind it up and take it in the form of snuff. It does not matter for us here in what form the tobacco is taken, for the results are the same. Of course, we understand that when the leaf is burnt, great chemical changes must be produced in it.

People have said that the nicotine and the other poisons in tobacco smoke must be burnt up, when tobacco is smoked, or oxidised away into carbonic acid and water. But anyone who tries to smoke a pipe for the first time will soon discover that something very curious gets into his body, and it has lately been proved conclusively that tobacco smoke *does* contain nicotine.

THE GREAT DANGER OF THE POISONOUS NICOTINE IN TOBACCO

The nicotine is destroyed in the tobacco that is burnt, but somewhere between the place where the tobacco burns and the smoker's mouth, the nicotine is made hot and turned into gas and sucked in. If the smoker merely drew nicotine into his mouth, and then puffed it out again, there could be no consequence except upon his mouth itself. The effect of smoking depends not upon what is drawn in, but upon what is absorbed; just as the effect of eating depends not upon what is swallowed, but upon what is absorbed.

However, nicotine is a very volatile, quick substance, and easily passes through the lining of the mouth into the blood. Unwise people sometimes have the trick of breathing tobacco smoke right into their lungs instead of merely sucking it into the mouth and puffing it out again, and they will even teach boys how to inhale the smoke of cigarettes for themselves. This is very difficult to stop once we start doing it. It means that far more of the things in the smoke are absorbed, because the whole great surface of the lungs—equal to 2,000 square feet, as we know, if it were spread out—is exposed to the smoke, and it is a surface that is specially made and suited for transferring

gases from one side of it to the other. Also, directly the smoker starts inhaling, this means that the smoke is now passing between his vocal cords, as they are called, with which he speaks or sings. Smoke is crowded with solid particles, which are caught on the vocal cords. Many of the gases in the smoke are very irritating, and all are hot.

How tobacco smoking spoils the voice and endangers the lungs

Thus, everyone who regularly inhales tobacco smoke is absolutely certain to spoil his voice sooner or later, even if nothing worse happens. It would be very easy to exaggerate the ill-effects of ordinary smoking; but there is a very great difference indeed, as we now understand, between puffing smoke in and out of the mouth, and inhaling it between the vocal cords into the lungs. Anyone who teaches and encourages a boy to do this is not that boy's friend, but his thoughtless and cruel enemy.

Enormous numbers of grown-up people smoke without its being possible for anyone to show that they do themselves any harm. As in the case of many other poisons, the first effects do not return. We have already learnt how marvellous is the power of living creatures to adapt themselves to circumstances. So, as a rule, the body learns, in a short time, how to take the gases of the smoke without being upset by them. The scientific way of saying this is that the body acquires *immunity* against the poison. The same applies to many other poisons, such as opium. In the case of opium, and some other poisons, the dose has constantly to be increased. This is not so much noticed in the case of tobacco.

But in the case of all these substances the rule is that at a certain time after we have taken the dose which satisfies us, we find that we want another dose. Certain changes which we are now beginning to understand occur in the body.

Why a smoker becomes restless and why tobacco soothes him

What happens appears to be that the original poison, such as the nicotine, or the morphia of opium, is broken up inside the body, and another substance is produced which has just the opposite effect upon the body. This may sound peculiar; but, in point of fact, we know scores of plants containing two oppositely acting substances, one of which is derived from the other. So what happens in the case of the smoker is, for instance, that the nicotine forms an "opposite of nicotine," which makes him just a little restless and uneasy; and then when he takes some more nicotine—that is to say, when he smokes again—this makes him feel restful and contented. So there is established what is usually called a "vicious circle." It is very often pointed out, and quite truly, that smoking has a good effect upon a man, because it makes him feel more contented and restful, and improves his temper. Quite so; but we ought to add that the reason why he wanted these things done for him is that his temper and contentment had been upset by the after results of the last time that he smoked.

A man may have smoked for many years, and yet, in only a few days, if he stops altogether, he may lose the craving, just because his body gets rid in that time of the last remains of the things that are made in it, which make him want to smoke again. After smoking without a break for fourteen years, the writer has just made this experiment upon himself, and so he knows that what has been said is true.

The great advantage of not smoking at all

Most smokers know in their hearts that they smoke too much, and wish to cut the amount down. There are various ways in which they may do this. It is good, for instance, to make a rule about smoking only after meals, or only after a certain hour in the day; or to make a rule of not carrying tobacco about in one's pockets. Many people have found that if they suck strong peppermint lozenges, this helps them to cut down their smoking.

All authorities on the subject will admit that it is best not to learn to smoke at all. No one can call smoking natural; no one can prove that it does any good except to relieve the symptoms which it has itself created, and which the relief of them will again create; and even if there be no injury done to life, which may well happen in cases of tobacco blindness, tobacco heart-weakness, and so on, there is always a certain amount of injury done

to the pocket. But, even supposing that anyone tried to argue that smoking was really a good thing for grown-up people, at any rate no one would dare to argue that it is good for children, or young people of any age or of either sex. No one can say that the child needs the tobacco; no one can show that the tobacco does the child any good. All the likelihood, of course, is that the developing body will be more injured than the already developed body. That is true without exception of every poison or injurious substance known, and is equally true of all living things, plants, animals, or human beings.

THE THINGS THAT MAKE A MAN AND THE THINGS THAT MAKE A SHEEP

Tobacco being a poison, no boy enjoys his first experience of it. He is encouraged to go on by an argument which would be quite the best argument in all the world if it were true. It is, that he should "be a man." This argument is applied to boys about things far worse than tobacco smoking. The boy is to smoke or drink, or whatever it be, because others who are older than himself do it; and so they say he will prove himself as much a man as they are. The real mark of a man is not that we should smoke, or drink, or shave, or be six feet high; the real mark of a man is to be ourselves, to do things or not to do things because we so think fit; and the mark of not being a man, however old or big we are, is to do things because other people do them. So when they say "be a man," they really mean "be a sheep"; and that is what we should reply in such a case. This is a very important matter, because it applies to many other things besides smoking; and it would be quite important enough even if it only applied to that.

THE KIND OF BOY WHO IS A REAL MAN AND MAKES HISTORY

The writer remembers, as if it were yesterday, his feeling of being grown-up and manly, and as clever as older boys, when he first smoked. No one expects boys to have the sense of men, and it is natural for boys to feel manly in such a case when older boys admire them. But the difference between a real man and a sheep remains; and, if it comes to that, just as a grown-up man can be a sheep, so a boy can be a man at any age, not by making himself feel miserable in doing the things grown-up men do, but by deciding for himself what to do, and what not to do, without reference to foolish people. It is this kind of boy and this kind of man that makes history, that has made the world what it is worth to-day, and will make it worth more in the future.

There has been a good deal of talk in many states during the last few years about this question of children smoking, and it has been agreed by everyone that it ought to be stopped. It is not at all easy to do, because the proper way to do what is needed for children is through their parents, and there are children whose parents do not care—babies in perambulators whose mothers give them beer to sip, and little schoolboys whose fathers are quite proud to see them smoke a cigarette. However, in England and in some of our states also, laws have been made which deal with children smoking, and which will do something, at any rate, to protect children from themselves and from foolish people in this respect.

THE KNOWLEDGE THAT HELPS US TO DO RIGHT AND ACT WISELY

Any child under sixteen found smoking in the street or in a park must be stopped by the policeman or the park-keeper; and any boy so found smoking may have his pockets searched. Tobacconists may be punished if they sell cigarettes to children. No doubt these are quite proper laws; but we must not forget the usefulness of knowledge, and the wisdom of trying to make people sensible so that they can govern themselves. It is a thousand times better for a boy not to smoke because he has learnt about smoking, and has decided that it is more sensible for him, on the whole, not to smoke, than not to smoke because he is never sure whether there is a policeman round the corner. There are always these two ways of getting people to act properly, and no doubt the way of compelling them from the outside is often necessary; but the people whose lives are worth most to themselves and to the world are those who govern themselves wisely from within; and knowledge has its highest value because it helps them to do so.

The next part of this is on page 3561.

WHAT THESE PICTURES SHOW US

WHEN you write letters to your little friends, have you thought how wonderful it is that all you have to do is to put a stamp on the letter and drop it into a box? The little green post-boxes in the streets are like fairies' houses: if you post your letter in them you may be quite certain that it will find your friend. It does not matter where your friend lives — whether across the sea in a far-off country, in a little village, or in a great town. If the magic stamp is on the letter, the letter will find its way to the right place. The postman is one of the real fairies of the world, and we read here the way in which he sends our letters on their journeys through the world.

HOW OUR LETTERS COME TO US

CONTINUED FROM 3192

WHEN you go to your breakfast some morning you may find that a letter has come from your uncle or your big brother across the sea.

Suppose that it is from the Hawaiian Islands. The distance is nearly six thousand miles from New York.

It has cost only two cents to send that letter all those thousands of miles. It may have been posted in some little office on one of the islands with a two-cent stamp on it. Then it was put into a bag and taken to the post-office in Honolulu. Then it was put into a bag containing many more letters for the United States.

This bag was put on a ship, carried to San Francisco, put on a train and carried to New York. There the bag was opened, your letter taken out and at last brought to you by the postman.

Now let us see what happens when we send that letter away for other friends to read. Suppose they live in Buffalo.

We put the letter into an envelope, write the address on the outside, put on a two-cent stamp, and drop the letter into the green post-box on the corner. Soon the postman comes, unlocks the box, takes out the letter with the others, and hurries off with them to the post-office.

Many other bags of letters are there, hundreds and thousands of letters, going to all parts of the world. They are emptied out of their sacks and given to one who has a little machine which marks all the stamps on the letters. This machine also prints the name of the office, the date, and the time the letters were received. It works very quickly, printing several hundred every minute. Then off go the letters to another man, who looks quickly at them. Some are for Boston, some for Chicago, some for little places in the country. Your letter is for Buffalo, so let us follow it.

Into a bag it goes with hundreds of others; then off to the railway station to catch the train which carries the mails. There is a complete little post-office on the train, and while the train shoots along, men work just as if they were in a city post-office.

They open the bags and begin to sort the letters again. The letters which go to the smaller places where the train does not stop are put in bags, which are arranged mouth upward, before the mail clerks. As the train approaches one of these little stations, the bag is closed and locked. One of the mail clerks stands in the door of the mail car, which has doors on the side instead of on the end.

At nearly every little station is a post, the use of which you will see. As the train comes to the station almost at full speed, a bag is thrown out,

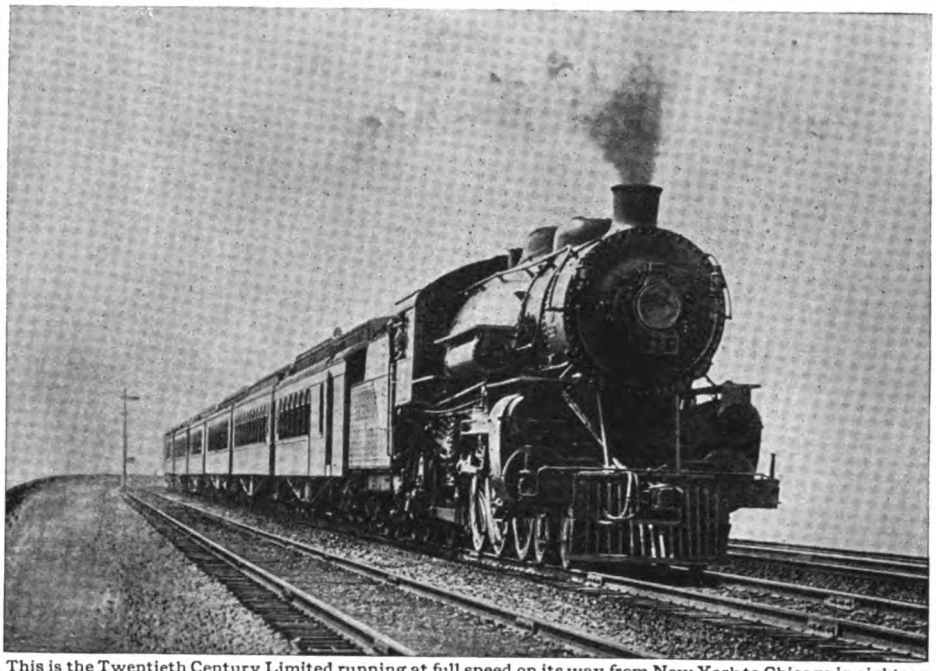
THE STORY OF THE LITTLE GREEN MAIL-BOX

When you post a letter to your friend in this letter-box you need have no fear. The letter will find its way safely to any part of the world if you put a stamp on it.

Nobody but the postman can touch the letter after you have posted it. The postman clears the box, and carries the letters in his bag to the post-office.

At the General Post Office the letters are all put in a heap and carefully arranged. All the letters for the city are put together, and all the letters for New England, the South and other sections are put together. They are then placed in bags and labelled for the State or town; and the bags are then taken to the station.

HOW THE MAIL TRAVELS



This is the Twentieth Century Limited running at full speed on its way from New York to Chicago in eighteen hours. It stops for passengers only at the largest cities, and the change of engines is made in a few minutes. Our grandfathers spent weeks on this journey, now made with comfort in less than a day and night.

This is the interior of a mail car on a long run. This car carries mail for distant points, and here you see the clerks, who are employed by the government, distributing it into proper sacks, which are held open before them. They grow so expert that they almost never throw a piece into the wrong sack.

Pictures by courtesy of the New York Central Lines.

and the train never stops. But attached to the post is a bag of letters which is to go on the train. A hook from the mail car is extended and draws the bag into the car. In this way, while the train is racing along at a mile a minute, one bag of letters is left at a town and another bag is taken up. If you have written a letter to the town, it is dropped at the station as the train passes by; if you have a friend there who has written to you, the letter is picked up by the train as it passes the post.

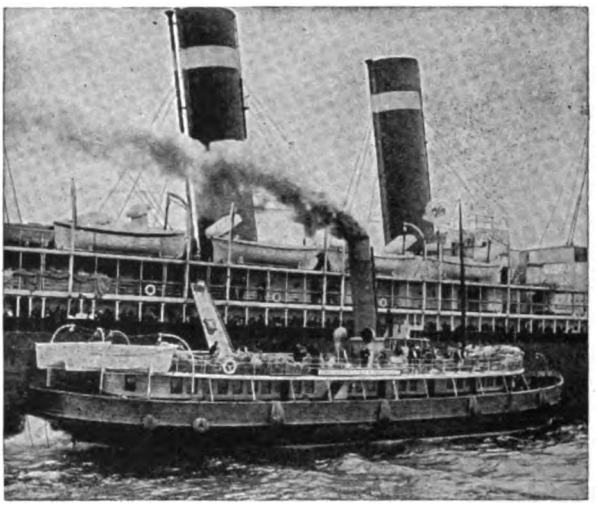
By the time that the train reaches Buffalo, your letter has been made ready to be delivered.

All this has cost you only two cents. If you wanted to send only one letter across the sea, and had to get a ship specially to carry it, it would cost you thousands of dollars. But it is as easy to take a thousand letters across the sea as to take only one, and so the Post Office gets thousands of cents for one journey.

There are places where it is very hard to get a letter. Dr. Livingstone, the great traveller, lived for five years without ever having a letter, and there are parts of Africa still where it is very hard to get letters. When they are taken off the ship, they are sent up the country by rail, as far as the trains run. Then they are made up into bundles, and men carry them on their heads through the swamps and the jungles, where snakes and wild animals are. In some parts of Africa the mails are carried on the backs of camels. Not long ago a camel broke away in the night. It ran away and died in the desert, and could not be found. It carried on its back a bag of letters for people far away in the wild country, who would be very sad when the man arrived to tell them that their letters were lost.

There are little islands where the ships call perhaps only once a year. One of them is Tristan d'Acunha, in the Indian Ocean, where letters are only delivered about once a year. A copy of the CHILDREN'S ENCYCLOPÆDIA has been posted to the youngest child on this island, who will probably not get it for six months.

HOW A SHIP DELIVERS LETTERS WITHOUT STOPPING



No time is lost in taking letters on their journey. This shows how a ship delivers letters without stopping. The big ship has brought bags of letters from China, and as it passes the great seaport towns it slows down while a little ship sails by the side of it and receives the bags. Both these ships are moving.

At last we hear the postman's knock, and our little friend receives her letter. It has come safely home after many exciting adventures by land and sea, and we may be sure that it is opened with great delight.

THE NEXT FAMILIAR THINGS BEGIN ON PAGE 3309

THE BUSIEST STREET IN THE WORLD

When we see a street like this, in the heart of a busy city, we understand the need for some rule of the road. Were omnibuses and carts allowed to go to the right or left as they thought fit there would be hopeless confusion, and all traffic would be at a standstill. The street shown here is Mansion House Street, in the centre of **the City of London, which is said to be the busiest thoroughfare in the world. Eight or nine different streets meet here, and many thousands of vehicles pass to and fro every day. In England the road traffic passes to the left instead of to the right, as in the United States and on the Continent of Europe.**

THE FATHER OF ENGLISH POETRY

GEOFFREY CHAUCER READING POEMS FROM HIS CANTERBURY TALES AT THE COURT OF EDWARD III.

Chaucer, the first great English poet, lived in the 14th century, before the days of printing. The poet was a favourite at the court of King Edward III., and at times he would read his poems before the king and his courtiers, in the way which Ford Madox Brown, the celebrated painter, has illustrated so happily in this picture.

William Shakespeare with some of the great men of his time

FOUR GREAT ENGLISH POETS

CHAUCER—SPENSER—SHAKESPEARE—MILTON

CONTINUED FROM 3252

It is well to know something of the lives of the great poets, not merely because they may be interesting to us as men, but because in knowing their lives and remembering the periods of time in which they lived and wrote, we are gaining something towards the understanding of English literature. Thus, if we remember that the first really great English poet was Geoffrey Chaucer, who was born about the year 1339, we shall always have his lifetime fixed in our mind as an important period in the history of English literature. It is true that before Chaucer there were many poets, but most of them were of the monkish class, who wrote the Latin tongue, and none of them compare with Chaucer for lively imagination, knowledge of life, and broad sympathy with their fellow-men. One of the most notable of these very early poets was Caedmon, about whom we have already read in the CHILD'S BOOK OF POETRY.

As Chaucer is very rightly called "The Father of English Poetry," we cannot do better than begin with him. Naturally there is not a great deal to be told of the life of a poet who lived more than 500 years ago. His works are the chief means we have of discovering the character of the poet, and through them we get to know that Chaucer must have been a very hearty, good-natured, laughter-loving sort of man, who did not take life too seriously or yet too lightly. Indeed, if we may judge him as a man by the impression which his poetry leaves on us, we can say that Chaucer was in every sense a typical Englishman, not only of his own time, but of all time.

He loved the simple things of life; he rejoiced in the beauties of Nature; he was fond of his books, and liked to be comfortable at home; he could laugh with the merriest at any tale of roguery, but he had his serious side and a reverence for religion. These are all qualities that may be found in the true Englishman, and it is thus that, through his writings, we can form some idea of the character of the man.

It is true that the name of Chaucer is not an English name, and his remote

forefathers may have followed William the Conqueror from Normandy into England, as the name was evidently of French origin. But, however that may be, his father, John Chaucer, was a citizen of London and a wine merchant there at the time of Geoffrey's birth. Geoffrey must have come of a good family, for he had the education of a gentleman, but we do not know whether he was a scholar of Oxford or Cambridge, although he has been claimed for both of these universities.

How Edward the Third helped to pay the ransom of Chaucer

As a young man he would seem to have been of very attractive character, for he became a great favourite at the court of Edward III., and was taken a prisoner in France when following the king as a soldier, the king himself showing his interest in his follower by contributing £80, which at that time was a considerable sum of money, towards his ransom. But the young poet was more particularly a friend and follower of the king's son, John of Gaunt, and by his marriage, at the age of twenty-six, to Philippa de Rouet he became brother-in-law to that famous prince. We may suppose, therefore, that, although we only know of his father as a prominent citizen and a seller of wine, the Chaucer family was of sufficient eminence for Geoffrey, with his many native gifts, to find the way open to success at the king's court.

Indeed, during the reign of Edward III. his life was filled with prosperity, and he held various posts in the service of the king, and went abroad at different times as ambassador.

Chaucer's visit to the continent and what he learned there

It is thought that on one of these missions, when in Italy, he may have met the great Italian poet Petrarch, who was one of the foremost figures at that time in the mighty movement which we describe as the Renaissance. This word really means a re-birth, and by the Renaissance is meant the renewal of intellectual energy, the flourishing of a new love for the beautiful things of the mind, which are expressed in great literature, painting, and sculpture. For long ages after the decline of the ancient learning and arts of Greece and Rome, these beautiful things had, like the plants in the winter-time, been asleep, but in the age of Chaucer they had, as it were, shot up again and burst into flower. Italy was the centre of this new flowering of the arts, and it was Chaucer's splendid work to import into English literature something of this new spirit which had arisen on the Continent.

But we must remember that he was not a writer for gain, as most writers are in later times. His was the life of a courtier and a gentleman, and his writings were the fruit of his leisure, the expression of his own joy in life. Nor were his days all smooth and easy, as he did not find King Richard II. so kind to him at first as Edward III. had been; but after a time he gained the favour of that monarch, and when Henry IV., the son of his old friend, John of Gaunt, came to the throne, he again enjoyed prosperity, although towards the end of his life he seems to have known the want of money at times. Whatever his troubles may have been, they never lessened his love of poetry, and some of his finest pieces were written in the autumn of his days.

The death of Chaucer and the birth of Spenser, the next great poet

Chaucer died in 1400, and as he had lived before the invention of the printing press, his writings during his lifetime had circulated only in handwritten copies; but about seventy-five years after his death the famous printer, William Caxton, brought out the first printed edition of "The Canterbury Tales." A selection of stories from these has been printed in the CHILD'S STORY OF FAMOUS BOOKS.

After the death of Chaucer, many years passed before another great poet arose in England. Indeed, the century and a half between his death and the birth of Edmund Spenser is often described as the "twilight of genius," by which is meant a time when there were no men of great gifts devoting themselves to the art of literature. Perhaps the reason for this lay in the fact that for many years England was torn and distracted by civil war, and men had but little time for the gentler things of life. But when Edmund Spenser arose as a new poet, he heralded the coming of the greatest outburst of poetic genius in that country's history. He was really the first of the great Elizabethan poets.

SPENSER READING HIS POETRY TO RALEIGH

Edmund Spenser was the herald of a great revival in English poetry. In his poems we see the last traces of the English language as it was written by Chaucer, while he has brought the modern English, soon to blossom in Shakespeare's poetry, within sight of perfection. Spenser at one time of his life experienced good fortune and was a friend of many eminent men, although he died in poverty. In the above picture we are shown the poet in his happiest days, reading some pages from his newly written "Faerie Queene" to Sir Walter Raleigh.

Edmund Spenser was born in London, most likely in 1552 or 1553, and came of a family of some distinction, though he was not born to worldly riches. He was educated at the Merchant Taylors' School, and was thus perhaps the first of the many famous men to pass through the school, which had then been but recently founded. He was a student at Cambridge, and later, because some young lady would not have him for a sweetheart, he turned to his study and the writing of verse in order to forget his disappointment. Many a one has done that since and produced the most deplorable verse; but Spenser, happening to be a genius, thus wrote "The Shepherd's Calendar," which was published in 1579, and has justly been described as "the first clear note of the great Elizabethan poetry."

A warm and intimate friend of Spenser's was the heroic Sir Philip Sidney, himself a charming poet, and it was due to his influence that Spenser, in 1580, received an official post in Ireland, where the remainder of his short life was passed, for the most part in pleasant circumstances. His fame as a poet rests on a great work of poetry now more often spoken about than read, "The Faerie Queene," from which we have read several stories in the CHILD'S STORY OF FAMOUS BOOKS, page 687. The first three parts of this work were published in 1590, and made his name famous even in his own day; but the end of his life was sad, for, during a rebellion in Ireland, the castle in County Cork where he resided was burned by the rebels, and Spenser had to flee

Coming to London, it would seem that not all his fame could find him new friends in the hour of need for he died at a tavern in King Street, Westminster, on January 13, 1599, "for lacke of bread," according to Ben Jonson, another of the great poets who lived in Spenser's day. Spenser was buried in the Poets' Corner of Westminster Abbey. There he rests among those for whom he chiefly wrote, as he is often called "The Poets' Poet," because, thoroughly to understand and appreciate his writings, one must be something of a poet oneself. And he lives in literature not so much as a poet for all to read, but as a great and beautifying influence on other

writers, both of prose and poetry. The trouble now is not to name the famous poets, but which to leave out; for following Spenser they come so thick and fast, and so many are worthy of attention, that but for the mighty name of Shakespeare, which overtops them all, it would be difficult to pick and choose among the poets of Elizabeth's time.

SHAKESPEARE THE GREATEST POET IN A GOLDEN AGE

There are Michael Drayton, Christopher Marlowe, Ben Jonson, Philip Massinger, Francis Beaumont, John Fletcher, John Webster, George Chapman, and others who, in an age when no giant such as Shakespeare had lived to overshadow them, would all have seemed even greater men than we know them to have been.

But from this great and rich period of English poetry we are forced to take Shakespeare alone, and in him we have the essence of the whole, for all that was finest in the Elizabethan age is reflected and made immortal in the plays and poems of Shakespeare. At that time the stage rather than the study was the aim of all the poets. In the new energy which had come to old England, the poets, inspired by the mighty deeds of Elizabeth's victorious sailors who were opening up a vast and wondrous empire for England, had to choose models for their art, and they went back to the ancient days of Greece, when the poets wrote plays to be performed in the theatres of that wonderful land. That is why we call the revival of learning in Elizabeth's time a "classical revival." The chosen model of Shakespeare and his fellow-poets was the Greek drama, and in this respect the Elizabethan renaissance differs from the earlier renaissance, of which Chaucer was the finest product in England.

THE LITTLE THAT WE REALLY KNOW ABOUT THE LIFE OF SHAKESPEARE

One of the most surprising things in literary biography is the fact that, although one writer quite truthfully says of Shakespeare: "We know little more of him than we do of Homer"—and of Homer we know practically nothing, not even his birthplace—a whole library of books has been written about the man William Shakespeare. It would really seem that the fewer facts we have about the life of any great man of the past, the more books are likely to be written in attempting to tell the story of his life. The chief difficulty with Shakespeare is to conceive a man of such great genius as his works disclose who yet lived a very ordinary sort of life, for what little we do know of England's greatest poet scarcely bears out the imaginary picture of the man we are apt to draw in reading his plays.

In the little town of Stratford-on-Avon, still one of the most beautiful in the green Midlands of England, William Shakespeare was born on April 23, 1564. His father, although he had many ups and downs in his life, and seems to have been a jack-of-all-trades, cannot exactly be said to have been "in humble circumstances," as he cut something of a figure in the town, and was for a time its mayor. For all that, he was not a successful man, and the time came when his son William had to lend him money to help him out of difficulties. His father could not write his own name, and for all the writing which he himself did in later life, the only examples of his signature which have been preserved might be thought to indicate that even William wrote his own name with difficulty!

A DAY AT SCHOOL IN STRATFORD-ON-AVON WITH THE BOY SHAKESPEARE

The boyhood of Shakespeare would, in all probability, be passed like that of any other tradesman's son of the time, with the healthy sports of a rural town for pastime, and the local grammar school as his home of learning. He had an excellent teacher at the grammar school, Master Walter Roche, who received the handsome salary of $100 a year—but in those days a quarter was of as much value as five dollars is to-day—for acting as headmaster. William would have to be up betimes to take his place in the old grammar school, which is still standing, though considerably altered; for lessons began at six o'clock in the morning in the summer weather, as daylight was precious in those days, when such wonders as gas and electric light were still undreamt. But he would not have far to go

> with his satchel
> And shining morning face, creeping like snail
> Unwillingly to school,

as it was less than ten minutes' easy walk from his father's house in Henley Street to the local grammar school.

It is more than likely that this same young William Shakespeare was dressed just like the other lads of the town, in a long and loose cloak hanging nearly to his ankles, with short, wide sleeves, through which his arms were thrust. But his cloak would not altogether hide the more picturesque part of his attire, consisting of a short, well-fitting jerkin, his puffed hose sticking out from beneath the waist to the thighs, above his long, dark-coloured stockings. His shoes would be strange affairs that bulged somewhat at the toes, being tied with long ends of their own material, and the satchel wherein he carried his books would be the only thing about him that a schoolboy of our time might wear without attracting the attention of every passer-by.

As for the boy himself, we know him for a bright-faced lad with high forehead and dark, abundant hair, his eyes of a light hazel colour, full of mischief and healthy merriment. Whether he was a diligent scholar, the pride of Master Roche, or something of a trial to that worthy teacher, we do not know; but the poems he wrote in after life are so full of varied learning that we cannot but suppose the headmaster, who was famous for his teaching of Latin, found young Will Shakespeare one of his brightest and aptest pupils.

WHAT SHAKESPEARE WAS TAUGHT AT STRATFORD GRAMMAR SCHOOL

If a schoolboy of to-day were to read the lessons in natural history which Shakespeare and his fellow-scholars were taught, he would have good cause for laughter. "The blood of an elephant is the coldest blood in the world, and dragons in the scorching heat of summer cannot get anything to cool them but this blood." That is a startling statement from a natural history of his time, and will show how little Shakespeare could have known of the ways of wild life outside of his native woodlands, where, as a young man, it is said, he went hunting the deer, and was once haled before a magistrate as a poacher.

The crabbed and crooked style of writing, which was known as "old English," was the style taught by Master Roche, who was rather behind the times, as even then in London and the universities students were being taught that open flowing script known as "Italian," such as we write to-day. If we knew nothing else about Shakespeare, his signature would prove that he had been educated in a provincial town. But whatever the defects of the course of education at the Stratford Grammar School may have been, William Shakespeare learned enough there to enable him to express, with all the power of his wonderful genius, the great and beautiful thoughts that later blossomed in his mind. He received during his six years at the school the key with which he was later on to unlock the treasure-house of his imagination for all the world and for all time.

THE YOUTH OF THE POET AND WHAT HE DID AFTER HIS SCHOOLDAYS

Of Shakespeare's youth we know as little as we do about his schooldays. He would be fourteen years of age when his father's fortunes had sunk so low that, in all likelihood, John Shakespeare could not allow his son to continue longer at school, and would have him withdrawn that he might earn something to help in keeping the home. To what employment the young man turned his hand, we do not know for certain. It has been said that he was engaged as a butcher's boy, perhaps in his father's shop. It has also been said that he became a lawyer's clerk, the remarkable knowledge of the law which he displays in his writings being quoted as evidence in support of this, though it is no good reason for supposing he was ever so engaged. What we do know for certain is that he was none too wise a youth, for he was not quite nineteen when he married Anne Hathaway, the daughter of a well-to-do farmer near Stratford. His wife was eight years older than he, and we cannot suppose that his unfortunate father was happy at his headstrong son taking upon himself the responsibilities of married life when his help was so needed at home.

YOUNG SHAKESPEARE GOES UP TO LONDON TO MAKE HIS FORTUNE

Three or four years after his marriage, and when he was the father of three children, Shakespeare went to London to seek his fortune. How he lived in London during his early years there, we do not know, but the story that he was glad to hang about the theatre to earn a little money by holding gentlemen's horses may be as true as

anything else we know of his early life. About 1587 he became a member of one of the very few theatrical companies which existed in those days, and possibly started in some such humble office as that of prompter, the man who stands behind the scenes with a copy of the play to prompt the actors should they forget their words.

We know that by 1590 he had begun to try his hand at writing, or perhaps revising, plays, while he was now himself appearing on the stage as a performer. He seems, however, to have been no brilliant actor, and even when his own plays were acted he never had any important part to fill in them. Fortunately for the world, he was something far greater than the greatest actor that ever lived, and it is to the credit of the Londoners of his time that his series of great comedies and tragedies, which began, most likely, with "Love's Labour's Lost" in 1591, and ended with "The Tempest" in 1611, met with so hearty a reception that their author, who had also become part owner of the Globe Theatre, was a comparatively rich man in the year 1600.

SHAKESPEARE MAKES A FORTUNE AS AN ACTOR AND A WRITER OF PLAYS

His plays, however, did not bring him so much money as he earned by acting. It is often the case that great work is but poorly rewarded, while inferior work enables men to grow rich. It was so with Shakespeare, for although he was famous as a playwright and a poet in his own day, that fame would have brought him but little profit, whereas his very ordinary powers as an actor enabled him to earn $650 a year, which would be equal to fully $5,000 at the present day. Unlike most of the actors and poets of his time, Shakespeare was a thrifty man, and so by the year 1597 he was able to purchase the largest house in Stratford, known as New Place, which stood close by the grammar school of his youth.

He still lived in London, however, where he had a house near to the Blackfriars Theatre, and no doubt there was some element of pride in his purchase of New Place, for he did not occupy the house himself until he bade farewell to London and the stage in 1612. All men have a desire to stand well in the estimation of their fellow-townsmen, and probably Shakespeare was not above wishing to impress the folk of Stratford with an object-lesson in his worldly success. To see the son of the unfortunate John Shakespeare become the owner of the largest house in the town would impress them more than to know that he had earned fame in London as a poet and playwright. He would also have in mind the day when he meant to retire and settle down in ease and comfort in his native town.

WHAT A THEATRE WAS LIKE IN THE TIME OF SHAKESPEARE

But the most successful years of Shakespeare came after 1600, when his popularity both as a dramatist and an actor was at its highest, and the success of the Globe Theatre brought him a splendid income. The theatres of those days did not resemble the luxurious buildings of our time. Outwardly, they looked not unlike a sort of castle tower without a roof. Around the inside of the walls the seats were fixed in three galleries above each other, and from one side the stage was built out, occupying almost one half of the interior.

No scenery was used, and part of the audience sat in boxes behind and above the stage, and even at times on the stage itself, while the people in the arena or pit had to stand. Nor were there any actresses in Shakespeare's time. The female parts were all performed by boys or young men dressed like women, and thus the great dramatist, who conceived such sweet and noble women as Rosalind and Desdemona, never saw them embodied by actresses. But if there is not a great deal we can tell about Shakespeare the man, there is almost no end to what might be written about his wonderful plays and the life of his time, but here we cannot further dwell upon the subject, though it is of the deepest interest.

SHAKESPEARE'S FAREWELL TO LONDON AND HIS RETURN TO HIS NATIVE TOWN

We know that so successful was the playwright Shakespeare in the later years of his life in London, that his income was as much as $25,000 a year in the money of our day, and he was steadily adding to his landed possessions at Stratford, whither he withdrew from the gay and busy life of the great city, and settled down as a man of wealth and property in 1612. "The latter part

SHAKESPEARE IN TROUBLE & IN TRIUMPH

This picture, by Thomas Brooks, illustrates a well-known story of Shakespeare's youth. The poet is said to have been arrested for illegally hunting deer in the forest at Stratford and brought before the magistrate, Sir Thomas Lucy. It is quite possible that the story is true, and certainly in later years Shakespeare made sly fun in one of his plays of this same Sir Thomas, which seems to show he had some old score against him.

In this picture, by Eduard Ender, Shakespeare is seen at the height of his fame in London, reciting his great tragedy of "Macbeth" before Queen Elizabeth and a group of her courtiers. Although we have no knowledge that such an event ever took place, it is certainly a pleasant picture to contemplate the greatest poet thus entertaining the greatest English queen in that wonderful age when the British Empire came into being.

of his life," says the dramatist Nicholas Rowe, who edited an edition of Shakespeare's works in 1709, "was spent as all men of sense wish theirs may be, in ease, retirement, and the conversation of his friends." He saw both his daughters married, his only son having died in his twelfth year, and he went about among his townsmen just like an ordinary country gentleman. It is pleasant to contemplate this aspect of the greatest poet. The time had not yet come when men made a profession of literary work, and pretended to be a class apart from the general community.

Shakespeare wrote his great plays only to supply his fellow-actors with something to perform, and they were immortal works because their writer had immortal gifts of mind which were fated thus to be conveyed to mankind at large. He went to no university to equip himself for the task, for no training of professors or tutors could have breathed into him one little spark of the divine genius inborn in the man, which was bound to shape itself somehow.

THE LAST DAYS OF ENGLAND'S GREATEST POET, AND HOW HE DIED

Shakespeare came at the right time, when interest in the stage as a medium of poetic entertainment and instruction had revived, and his native powers were so much greater than those of all the scholars of his day that even in an age when learning and scholarship were dearly prized, and he had less, in a scholastic sense, than many of his fellow-dramatists, he outshone, and will outlast, them all. In every sentence of his plays and poems we can see the easy, confident hand of a mighty master, and we know that he himself was conscious of his greatness, for he writes in one of his beautiful sonnets:

Not marble, nor the gilded monuments
Of princes, shall outlive this powerful rhyme.

In March, 1616, the poet was taken with illness, which is said to have been the result of a merry meeting with his friends Michael Drayton and Ben Jonson, who had visited him at Stratford; and on his birthday, April 23, 1616, William Shakespeare died in his fine house at Stratford. He was laid to rest in the chancel of the parish church, where over his grave these words are carved upon a flat stone:

Good friend, for Jesus' sake forbear
To dig the dust enclosed here.
Blest be the man who spares these stones
And curst be he who moves my bones.

We know not who wrote these lines, but no one has ever ventured to break this solemn command, and there the dust of England's greatest poet still reposes.

THE BIRTH OF JOHN MILTON AT THE SIGN OF THE SPREAD EAGLE IN LONDON

When Shakespeare died at Stratford, there was an eight-year-old boy in the City of London who was destined to be not only the next great poet to Shakespeare in point of time, but, after Shakespeare, the greatest of all English poets. His name was John Milton, and he was born in Bread Street, off Cheapside, on December 9, 1608. In those days it was the custom of tradespeople and others to hang a sign at their door, exhibiting some device by which their place could be easily recognised. This old-fashioned custom is still observed to-day, though less frequently than formerly. Among the many signs that decorated Bread Street three hundred years ago was one of a spread eagle. At the house so marked lived John Milton senior with his family, and there he carried on the profession of a scrivener. This work was in some respect like that now discharged by solicitors, such as drawing out wills and preparing other legal documents; and scriveners were also lenders of money.

This John Milton senior must have been of strong, independent character, for he had brooked the displeasure of his father by renouncing the Catholic religion, which had been the faith of his family, and adopting Protestantism.

THE GREAT STRUGGLE THAT WAS BEGINNING WHEN MILTON WAS BORN

He was thus one of the Puritans, as they were called, for these were the days when a great struggle was dimly beginning between two different types of the English mind. Although the country was supposed to be Protestant, and the king a Protestant also, many people were at work to shake the religion of the land, and while these would have permitted much that was loose and lax, there grew up against them others who, going to the opposite extreme, took the letter of the Bible rather than its spirit as their guidance, and became noted for their strict observance of religious duties.

These were the Puritans, who in the lifetime of the younger Milton were destined to carry out a great revolution in England. Although the father of the poet belonged to those strict religionists, he was a man of literary and musical tastes. His qualities were inherited by his son, and the seed of poetry, which young Milton had received from his old Puritan father, blossomed in time into one of the finest flowers of the world's literature.

The boy Milton would be about twelve years of age when he was entered as a scholar at St. Paul's School, his education before that time having been received at home from a Scots tutor.

OLIVER CROMWELL AND HIS FAMILY LISTENING TO MILTON PLAYING THE ORGAN

Great was the boy's love of books, for not even his weak eyes and the headaches which resulted from his close studies prevented him, even at this early age, from poring over his well-loved books beyond the midnight hour. A day was to come when the strain thus placed upon his sight was to leave him blind, but even then he had the consolation of knowing that he had used his eyes to some purpose by storing his mind with the richest knowledge of his age. For even as a schoolboy he had learned his Latin and Greek so well that he could write in both these classic languages in prose and verse, and of Hebrew also he knew something. Among his earliest efforts in verse-writing were translations of the 114th and 116th Psalms. He was in his sixteenth year when he went to Cambridge University, where we are told his gentle manner, his long, light-brown hair, parted in the centre as we see it in the familiar portraits, his delicately coloured complexion, gave him, among his rougher classmates, so girlish an appearance that they christened him "the Lady of the College." But we may doubt if their taunts in any way ruffled his calm and independent spirit, as we know from his own words that even from boyhood he was conscious of his mighty powers of mind. He puts it in his own fine words in the following lines:

When I was yet a child no childish play
To me was pleasing; all my mind was set
Serious to learn and know, and thence to do
What might be public good; myself I thought
Born to that end, born to promote all truth,
All righteous things.

Sometimes the great man does not seem to know himself as great, but we have seen that Shakespeare was just as confident of the immortality of his poetry as Milton of the high destiny to which he felt himself called. And the study of his life also leaves us with the impression of a calm and noble spirit that was a stranger to haste, moving serenely but confidently onward to the work that was designed for him. He had been fully seven years

at Cambridge when he quitted the University with the degree of M.A., and went to his father's country house at Horton, in Buckinghamshire, where five more years of his life rolled on in the study of books and Nature and the writing of many poems which rank among the finest in the world.

MILTON RETURNS TO LONDON ON THE EVE OF THE CIVIL WAR

His mother's failing health had kept him at home, but when she died he was free for a time to set out on his travels and to see for himself those wondrous towns and countries of the Continent whose stories and literature he knew so well. So for some fifteen months he wandered among the storied towns of Italy and France, and the influence of the classic scenes of Italy did much to shape his thoughts towards the later poetical achievements of his life.

When he returned to London in 1639 the struggle between the people and the king, which three years later resulted in the Civil War, had become so serious that the whole country was unsettled. But Milton was essentially a man of peace, and instead of taking part in this great agitation, except by writing a series of bitter attacks upon the bishops, who were in league with the king, he devoted himself to the quiet task of teaching, and had a sort of boarding-school for a number of years in Aldersgate Street. But the bitterness of the struggle which was going on in these unhappy days entered into the poet's life in a strange way.

He married a lady who came of a Royalist family and had all the gay and flippant notions of the Cavalier class, who were the opponents of the Puritans.

MILTON MARRIES A ROYALIST LADY BUT IS STAUNCH TO THE PURITAN CAUSE

As Milton was, in his ways of life, the most grave and frugal of Puritans, it was not likely that his young wife could immediately find happiness with him, and after a few weeks she returned to her father; but two years later, when the fortunes of war had gone against the Royalists and their supporters, and Mary Milton had learned that life is something more than dancing and merry parties, she returned to her husband, and even her father was glad to have the shelter of the Puritan poet's roof.

Milton, in the meanwhile, had been writing not poetry but prose, and his finest work of this period was entitled "Areopagitica." That is a Greek word for an oration addressed to the Greek Parliament, which was known as the "Areopagus," and Milton gave this title to his work because it was addressed to the Parliament of his own country. The "Areopagitica" is a noble plea for the liberty of thought and especial y the right to publish in print one's honest opinions, and is regarded as one of the finest examples of English prose writing. Another prose work of Milton s, in which he defended the execution of Charles I., had an important bearing on his life, for it was esteemed so highly by the Puritan Government that Milton was appointed Latin Secretary to the Council at a handsome salary, his work being to draft the correspondence of the Government with foreign Powers, then carried on in the Latin language.

THE SAD, SIGHTLESS DAYS OF THE CLOSE OF MILTON'S LIFE

A new period of the poet's life now began. Eminent in the public life of his day, his great literary powers were employed, not in the mere translating of State correspondence, but in defending the Puritan Government against its critics on the Continent. It is the least pleasant picture of his career to look upon, for we feel that Milton was far too great a man to expend his powers in this direction. In 1653 he was left a widower with three young daughters to look after; but the greatest trial of his life befell him about the same time.

His eyes, which had been weak from boyhood, now failed him completely, and by the year 1654 the poet was blind. Still he bravely faced his work as Latin Secretary, first with an assistant, and afterwards with the aid of a colleague, Andrew Marvell, who was himself a poet of great power, and a man of fine character. For the sake of his motherless children he married again, but his second wife died some fifteen months after the wedding; so that Milton's daughters, at the most critical time of their lives, were left without a mother's guidance, and in later years were somewhat of a trial to their sightless father.

But if the eyes of his body no longer saw the beautiful things of earth, the

TWO SCENES IN THE LIFE OF JOHN MILTON

Milton was the great thinker in the days of the Commonwealth, when Oliver Cromwell ruled England with a firm hand. Both men did imperishable service to their native land. The poet in those days could not have lived by his poetry, and he was employed by the Government to conduct the official correspondence of the country with foreign Powers in the Latin language, then used for that purpose. While so employed he lost his eyesight, and had to have a colleague in his work. This colleague was a fine poet and a man of upright character, Andrew Marvell by name. In this picture, by G. H. Boughton, R.A., we see Marvell shaking hands with the blind poet.

As Milton was blind during the last twenty years of his life, and in those years composed some of his greatest poems, including "Paradise Lost" and "Samson Agonistes," his daughters had to be his eyes and write down the words as he dictated them. In the above picture, by Munkacsy, we see his daughters thus engaged, and perhaps none too willingly. For they grew tired of the labouring work which their father's blindness required of them, and in the later years of his life they behaved in a very undutiful way, much to the sorrow of the great poet.

eyes of his soul had now far finer visions of the unseen world, and in his leisure time he was engaged upon the composition of his grandest work, the great poem of "Paradise Lost." Meanwhile troubles of another kind were gathering round his devoted head.

CROMWELL, THE MAN OF THE SWORD, AND MILTON, THE MAN OF THE PEN

While Oliver Cromwell had ruled with his firm hand, Milton was also a power in England. Cromwell was the embodiment of the vigour and force of his England, Milton the great thinker of the Commonwealth. For years they had worked together, the one doing, the other advising. So that when Cromwell died, and his weak son Richard succeeded him, only to let the country go over to the son of the slain King Charles, Milton, having written so much against the Stuart kings, had for a time to hide himself in the days of vengeance which marked the beginning of the Restoration. It says something for the friends of Charles II. that the great poet suffered no personal punishment for his writings against Royalty.

There is no period of the great poet's life one would rather dwell upon than those days when he was supposed to have sunk into obscurity, but was really making his name immortal, raising for himself a monument of fame that will outlast all others of his age. Deprived of his public office, and living in a humble house, though still above poverty, the poet's days were spent in dictating the majestic lines of "Paradise Lost."

HOW MILTON GOT 50 DOLLARS FOR THE GREATEST POEM OF MODERN TIMES

It was during the Great Plague of 1665 that he removed with his daughters to a cottage at Chalfont, in Buckinghamshire, which he owed to the kindness of a friend, where the greatest work of his poetic genius was finished. In 1666, the year of the Great Fire, Milton got a London bookseller to print "Paradise Lost," and received in all 50 dollars when 1,300 copies of it had been sold.

He had still many admiring readers, though he received so little for his writings; but amid the gaieties of the Cavaliers, who now ruled England under Charles II., Milton's splendid poem could not be expected to touch the mind of the whole country as it would have done had it appeared in the sober days when Cromwell ruled, and the poet was admired as the greatest thinker in the land. "Paradise Lost" is the noblest poem in the English language, and one of the grandest works of the modern world. It is founded on the Bible story of Adam and Eve, and how they came to be driven from the Garden of Eden. No description that can be given here could convey to the young reader any idea of the majestic grandeur of the poet's awe-inspiring pictures, the stately beauty of his verse, the dramatic fire and colour of certain scenes, the gentle pastoral beauty of others. It is one of the great treasures of our literature, which all of you should read when you grow a little older.

The next work of Milton's, after his great poem was a "History of Britain," appearing in 1670, and in the year after that he published two more poems.

THE LAST WORKS OF MILTON AND THE END OF HIS DAYS

"Paradise Regained" is a much shorter and not so fine a work as his great poem, though its subject is the more inspiring one of the Saviour triumphing over the temptation of Satan. "Samson Agonistes," the title of the other, is from the Greek, and it is not easy to give it in English, but we might translate its meaning as "Samson the Contes'ant." It is a short dramatic poem, describing the last days and deeds of the mighty Samson, who, deprived of his sight, could yet exert his giant strength to the destruction of the Philistine temple. It is really an expression of his own life and thought in his closing years; for the poet himself was something of a Samson all his life, and, not less after blindness had smitten him, was devoted to pulling down the temples of the false gods, his poetry being unmatched as a plea for righteousness, apart from the great soul-stirring books of the Bible.

The closing years of Milton's life were spent in the simplest fashion, and he had the companionship and devotion of his third wife, Elizabeth Minshull, whom he had married in 1663, to make up for the desertion of his undutiful daughters. He died on November 8, 1674, and was buried in the church of St. Giles, Cripplegate, London.

The next Men and Women begin on 3483.

WHAT THIS STORY TELLS US

WE have discussed the earth as a whole, and from many special points of view, and we have tried to dive down as deeply as possible—though that is not nearly deep enough—in order to find, far under our feet, the explanation for things that show upon the surface. But, before leaving this part of our subject, we must devote our attention to one particular part of the earth's surface which is, indeed, the most important of all—the soil, upon which living creatures depend for their food. We are all rooted in the soil, and without the soil not one of us could be alive. It is an absolute condition of the existence of thinking moral beings, like ourselves, that the very outside of the earth's crust shall be changed into this stuff we call the soil.

THE SOIL AND ITS USES

CONTINUED FROM 3232

THE more we know about our world, the more clearly does it look as if life were its great purpose. We are to think of the planet as a theatre, an arena, a mother, for life; and we have already seen that it is the life of the land, which breathes air, that reaches the highest. Now, when we examine into this life, we find that it all depends upon what happens at the very surface of the solid earth, where earth and air meet. We find, further, that the outer few inches of the earth's crust, or it may in some cases be a very few feet, become changed by the influence of air and water and light and life into something which we call soil.

We speak of soiling a thing, because the soil is rather messy, as if the soil were rather beneath our notice. But we know that animal life absolutely depends upon vegetable life for its existence, and we find that vegetable life depends upon the soil for its existence. So we may say that really everything that makes the existence of a planet worth while, that is to say, all the higher life which it nourishes, depends upon the processes which are ceaselessly going on just at the very outside of the earth's crust.

When we are in the country or at the seaside, we can see for ourselves what the soil means, because we can notice, for instance, at the top of a chalk cliff, or a rock cliff, a narrow layer which is evidently different from the rest; that layer is the soil. One may see it at the top of the chalk cliffs on the south coast of England, and if we study it there, we must understand that we are studying what goes on everywhere throughout the dry land of the earth, except in deserts, or where there is eternal snow and ice; and upon this process, which we can study so easily for ourselves, up to a point, is dependent the whole life of man.

If we look at the chalk cliff from the beach, we see that a few inches at the very surface, instead of being white, are brown; the chalk has been changed into soil by the process called "weathering." The brown colour is due to iron, which, as we know, is a necessary condition of all life everywhere. Often the rain trickling down the side of the rock will carry a little of the iron with it, and so we may see little brown streaks staining the white surface of the cliff. Upon the surface of these few inches of altered cliff green vegetable life grows. Even since we began to study the story of the earth, a great many interesting and important facts have been made known about the soil, and we are fortunate in being able to learn them now.

We know that every living creature requires nitrogen as part of its food; we know, also, that about four-fifths of the atmosphere consists of nitrogen, and so the surface of the soil, and anything growing there, are exposed to this gas. Also, we can readily understand that, as the soil is rather loose, there is a good deal of air in it, and this soil-air, as it is called, also consists mostly of nitrogen.

So we should suppose that an ordinary green plant of any kind gets the nitrogen that it always needs, from the air in which it is bathed. We know that the green plant feeds upon the carbonic acid in the air, and we might suppose that, as it must have nitrogen, it feeds upon the nitrogen too.

THE NITROGEN WITHOUT WHICH ANIMALS AND PLANTS CANNOT LIVE

Now, we ourselves, and the lower animals, require nitrogen; but it is found that, though it passes into our blood from the air, we do not use it, and anyone who does not get proteids, which contain nitrogen, in his food, will die of lack of nitrogen, even though his blood contains quantities of it. The reason is that he cannot use nitrogen except when it is combined with other things. Now, a very striking and unexpected fact was discovered about green plants several years ago; they are exactly like us in this respect. Carbonic acid gas they can feed upon, though we cannot; but neither they nor we can use the nitrogen gas of the air. This was proved by some Englishmen about fifty years ago. But it is perfectly certain that the plant must get nitrogen, and everyone who has to do with plants knows that they must be supplied in the soil with compounds of nitrogen. The interesting question is: How are these compounds obtained?

We know that when there is a flash of lightning, or, indeed, whenever there are electrical disturbances of any kind in the air, a certain amount of the nitrogen and oxygen of the air combines, and the compounds thus formed are largely carried down into the soil by the rain. So here is, at any rate, one source of combined nitrogen for the use of vegetable life, and it is a source which is in more or less constant action.

THE GREAT MYSTERY OF THE NITROGEN THAT IS FOUND IN THE SOIL

But everyone who grows plants knows well that for practical purposes this source cannot be counted upon at all. If he trusts to it alone, and there are no compounds of nitrogen in the soil to start with, his plants will not grow at all, and this, of course, is true of all the crops upon which mankind lives. Or, rather, to be exact, we should say that the plant grows until it has used up the compounds of nitrogen contained in the seed from which it started. When that is done, the plant simply stops growing. So, plainly, there must be some other source of compounds of nitrogen besides what the rain washes down into the soil from the air.

We know this, also, because in some parts of the world there are enormous quantities of compounds of nitrogen in the soil—quantities which cannot possibly be accounted for in this way. *Something else* happens in the soil, by means of which the free nitrogen of the air is made to combine with other elements, and so turned into compounds of nitrogen upon which the green plant can live. We say that the nitrogen is somehow "fixed," and this question of the fixation of the atmospheric nitrogen is one in which all the students of the soil are now deeply interested, and some wonderful things have been discovered.

HOW THE MICROBE AND THE PLANT GO INTO PARTNERSHIP

There is a certain kind of plants which has long been known to have a special power of growing and thriving even without a supply of those compounds of nitrogen which other plants need. The proper name for these is *leguminous* plants. They are so called because they form a thing called a legume; and we may know what that is because a pea-pod is a legume. Now, we find that the plants that produce pods like that—peas, beans, clovers, and vetches—behave as if they had the power of feeding on the nitrogen of the air. When we examine crops of this kind, we find that they contain far more nitrogen than can be accounted for unless the air has been drawn upon.

The men who began to study these plants found that they have tiny little swellings at various places on their roots, and that if they have not these swellings, they behave just like other plants, and cannot use the nitrogen of the air. Further, these swellings are only found on the roots of plants which have been infected by a little soil. If the plants are grown in sand, and no soil is allowed to get near them, no swellings appear on their roots, and they cannot grow unless compounds of nitrogen are supplied to them. There is, then, something in the soil which makes these swellings, and which gives the plant the power of using the nitrogen of the air.

It was next found that these swellings are filled with microbes of a special kind. A sort of partnership springs up between the leguminous plant and the microbe, and this is only one instance of several that we know in which two different kinds of living things make an arrangement of this kind between themselves. The pea or bean, or whatever it is, supplies the microbes with sugar and starch, which microbes, not being green, cannot make for themselves, but which they find very useful. On the other hand, the microbes have the extraordinary power which no green plant has, of fixing the nitrogen of the air—that is to say, combining it with other elements. The compounds of nitrogen thus formed are handed over to the leguminous plant, which thus gets on just as well as if a rich supply of nitrates were being poured into the soil. So it was proved that microbes could fix nitrogen, but all attempts to make these microbes do the same for other kinds of plants, as, for instance, for wheat, failed completely. The arrangement will only work between these microbes and leguminous plants.

The Energy that the Nitrogen Gives to the Plant

Plainly, there was much more to be discovered, and that has now been done. The probability was that as there were microbes which could fix the nitrogen of the air, we should find other microbes, perhaps living free in the soil, which could also fix nitrogen, and could thus supply compounds of nitrogen for the life of green plants in general, trees and grasses, including cereals.

Now, there is a very important point which we must understand here. When we take nitrogen, and combine it with anything, power or energy is stored up, as we say; in other words, there is more energy in the compounds of nitrogen than there is in nitrogen itself. This energy is, of course, wanted and used by the green plant. But nothing comes from nothing. If we make compounds of nitrogen in the chemical laboratory, we know that, according to the quantity we make, so we must spend a certain quantity of electricity or heat; just as when compounds are naturally made in the air by electricity. Now, though life is a miracle and can do marvellous things, it can neither create nor destroy energy. It is a transformer, but not a creator. If a microbe makes a compound of nitrogen, it has to get from somewhere the power to do so, just as the chemist must when he does the same thing.

How the Microbes Feed the Plants with Nitrogen Compounds

This means, indeed, that if the microbe is to make compounds of nitrogen, it must be supplied in its food with power which it can put into them. In the case of the microbes that live on the roots of leguminous plants, the power comes from those plants; that is part of the bargain between them, and it comes mainly in the form of things like sugar and starch. These things contain power, for they make us strong, and when they are supplied to the microbe, it puts the power of them into the compounds of nitrogen which it makes.

But, now, this is very serious, for the green plant requires nitrates, but the microbe requires the help of the green plant before it can make the nitrates. The first question we must ask is: Where does the energy come from, in the first place? There is no difficulty about the answer. The energy comes from the sun. It is the power of sunlight that is stored up in the sugar made by the plant. It is that power which the microbe takes and puts into the nitrates it makes. Now, in certain parts of the world, we find soils which contain a very huge quantity of nitrates. In Russia, in Manitoba, and in the Argentine, we find these rich soils, which are, of course, the joy of the farmer, and which grow the most magnificent wheat. Huge weights of nitrates are contained in every acre of these soils, and the soil is feet thick.

How the Power of the Microbes Comes First of All from the Sun

We are certain that these nitrogen compounds have been made by microbes; not the same as those which live on the roots of leguminous plants, but others. But the law that all power must be accounted for has to be reckoned with. Where has the power come from which the microbes have used? It has come from the sun by means of the green plant. The whole meaning and explanation of these wonderful soils is that, for a long time past, natural vegetation has been growing

upon them, catching the power from the sun and turning it into substances which fall into the soil, and feed the microbes, and so enable them to fix the nitrogen of the air. At an agricultural college, where men are teaching the world some of these great facts about the soil, they have carefully compared the soil on two pieces of land, side by side.

HOW THE EARTH SAVES UP THE RICHES OF THE SUN

One of these has been cultivated in the usual way, and each year the crops, whatever they were, have been taken away by man and used. The other piece of land has been purposely left absolutely alone for a period of twenty-five years; it has been allowed to run wild, and it is now a bit of prairie land. The soil was carefully examined twenty-five years ago, and the amount of nitrates it contained was known. It is now found that the piece of land which has been cultivated contains no more nitrates than it did, and that the piece which has run wild has been collecting huge quantities of nitrates. Year after year the green plant has been growing. Its starch and sugar, instead of being carried away by the harvest-maker, have fallen back to the soil, and have fed the microbes which fix nitrogen.

We have quite lately discovered this very microbe, which is probably more important than all others in the world. It has rather a long name—*azotobacter*. This really means the bacterium, or microbe, that has to do with azote, and that is an old name for nitrogen. At this college they have lately examined soils from every part of the world, from Siberia, Australia, Canada, and so on, and everywhere, without exception, this microbe is found in the soil. It is a rather large, round microbe, but there is nothing about its appearance to tell us what its power is. If we could see into the heart of its life, we should find it to be a marvellous transformer of power.

A WONDERFUL MICROBE THAT IS LIKE A FURNACE AND BURNS UP SUGAR

It is like a furnace. It will burn up sugar and starch at a tremendous rate, and as it burns them up, it makes compounds of nitrogen. All over the world the growth of the green plant, upon which our lives depend, depends upon the exquisite balance of duty that obtains between the green plant, which can feed upon the carbonic acid of the air but not on the nitrogen, and this microbe, which can feed on the nitrogen, if the green plant will supply it with the products of its feeding. Indeed, what it means is this: that the astonishing discovery made about leguminous plants really applies to all green plants. The leguminous plants have a special arrangement of their own, and the special microbes with which they are in partnership actually live inside their roots. But what is true of them is true in essentials of plants in general, though the azotobacter and its relatives find it equally convenient to live free in the soil instead of housing themselves in the green plant's roots.

It is a necessary condition for the existence of the azotobacter that the soil be not acid. Here and there we can find soils which have turned acid because something or other has made or put acid substances into them. In such soils the azotobacter cannot live, and, as a consequence, we find that these soils are infertile. Sometimes we are ourselves to blame for this, for we add to the soil various substances meant to do it good, which, nevertheless, are got hold of by microbes, and turned into acids.

THE MILLIONS OF USEFUL MICROBES THAT LIVE IN THE SOIL

Instead of doing the soil good by this treatment, we destroy the azotobacter, and then things will not grow in it. We are now beginning to get an idea of the complicated character of the soil. Words cannot describe how crowded it is with microbes of all kinds. The surface of the soil is always receiving additions of matter from previous life, leaves, and stalks, and so on. Then there are animal remains, and so on, added to it, not to mention the manures which are added to it on purpose. All these things, as they pass into the soil, are rapidly changed, and it is very easy to prove that these changes are all due to microbes. If we take some soil, and heat it so as to kill the microbes in it, all these changes stop; or if we add to the soil something which kills microbes, such as chloroform, then also these changes stop. That, of course, is the last thing that we wish to happen, but most of these changes which go on in the soil serve to prepare the food for the green plant. As we already know, the

very leaves which it sheds in the autumn are turned into new food for it in the spring, if the microbes are allowed to do their work.

Now, the ordinary chemistry of the soil is, of course, very important. We have already seen how tremendously important is the difference between an acid and an alkaline soil, and so it is very important that we shall add to the soil, in certain cases, certain chemical substances, such as nitrates and carbonates, and salts of ammonia. Often, however, we may do more harm than good if what we add upsets the balance of power amongst the microbes in the soil, and we are more and more learning that it is really the living microbes, and not the lifeless chemicals, that decide what the result shall be. And so the question arises whether our new knowledge of the soil may not help us to feed it with microbes of the kind we want, and so to get even more success than by feeding it with any chemicals at all.

LAZY MICROBES THAT WOULD NOT WORK FOR THEIR LIVING

Students of the subject began by getting hold of the microbes which they found on the roots of leguminous plants. They managed to grow them by themselves, just as the microbes of consumption, and so forth, can be grown. And then they thought to apply these growths to the soil. They failed at first because the microbes, having been too well fed in the laboratory, had turned lazy, and simply would not work when they were put back into the soil. This is just one more instance of the universal truth which applies to every living thing and every part of it. Instead of having to work for their living, the microbes had been fed in little glass tubes with all sorts of nice things, which no doubt made them feel very fat, and plump, and comfortable, but made them useless, like all persons who are over-fed without having to work. However, that difficulty was got over; but even then it was found that either one kind or another of desirable microbes is *already* present everywhere in the soil.

A great many people believe that this feeding of the soil with living microbes is very useful; but, on the other hand, many other people are not yet sure that this has really been proved. Time will show, and, at any rate, there is little doubt that if we cannot yet do what we desire, we shall be able to do so soon. Now, there is a most important matter which we must insist on. When we use up coal, or so-called mineral oil, we are really using up the great capital of wealth which has been accumulated—saved up from the sunlight of past ages, by the plants which were then alive.

HOW THE SUNSHINE OF THE PAST FEEDS THE CORN-LANDS OF TO-DAY

And now we learn that in the new countries where we are growing crops to feed our ever-increasing millions, mankind is also living upon its capital. It is true that, in the great wheat-lands of Manitoba, for instance, the capital may be enormous, but it is not endless. The green fields of corn which cover such a great part of the earth to-day are, of course, using the sunlight of the present. We know that they could not grow without that. But if that were all they had to draw upon, they could not grow as they do. In the main, they are living upon the sunlight of the past, just as much as if we had to feed them upon coal, as we have to feed machines, which are not alive.

We have learnt that the wealth of the soil upon which these plants grow has gathered there, and has been transformed by the azotobacter from the sugar and starch which past green plants have made from the sunlight. The soils which are wealthy now are the soils which have saved before now, like the soil of the land which was left alone for a quarter of a century at the college, and which became rich because men did not come and take away from it the wealth it made from year to year. People are looking to science to help them in this matter, that is, if they think about it at all.

SOMETHING THAT NEITHER NATURE NOR SCIENCE CAN DO

They think that when the coal is exhausted, or when the rich soils are exhausted, science will supply something else. Now, science can do wonderful things, but it cannot make something out of nothing, for the very good reason that not even Nature can make something out of nothing. Science may learn how to use to its best all the sunlight that falls upon the earth at the present. But when we have used up the sunlight of the past, as we are now doing, that is

Magnificent harvests of rich wheat are reaped in lands like Manitoba, where for centuries the soil lay unused.

all mankind will have to live upon, for we cannot borrow the sunlight of the future. These are great questions which thoughtful people must begin to think about unless posterity is to turn upon us, and call our age the age of blind waste.

After this we must go on to another part of the STORY OF THE EARTH. We have already a good idea of what the earth is, and we have studied some of the other worlds in space in order to learn more about the world we live on. We have learnt also about the different kinds of elements that make up the earth, and the sun, and the stars, and the way in which those elements combine with each other. If we are to use big words, then we can say that we have studied geology and astronomy and chemistry and geography—not the geography which deals with frontiers and cities, but natural geography; and, lastly, we have even studied agriculture. There still remains a very important and very big study, the special name of which is physics—a name derived from the Greek word for Nature.

By physics we now mean the study of motion and heat, light, sound, and electricity. Of course, there is no real division between physics and chemistry, for instance, and we cannot understand the one without the other. Nature is not made in watertight compartments, though I am afraid we often talk and think as if she were, and as if our minds were. It is only for convenience, and because we cannot see everything at once, that we have to study one thing at a time. So next we shall go on to study motion, which is very much more interesting than perhaps we at present think.

The next part of this is on page 3465.

The great harvests in Canada are due to unused nitrates that have for centuries been accumulating in the soil.

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A FAMOUS POEM BY MATTHEW ARNOLD

MATTHEW ARNOLD, if not in the very first rank of English poets, is still to be regarded as one of the greater of the modern writers. In his character he reminds us somewhat of Charles Kingsley, as a lover of all that was manly, pure, and of good repute. He wrote many books, but chiefly in the realm of criticism, on which his fame is largely founded, although there are some who think his beautiful and inspiring poems will outlast his brilliant criticisms of literature and religion. The eldest son of Dr. Arnold, of Rugby, one of England's most famous schoolmasters, he was born on December 24, 1822, and died on April 15, 1888. Most of his active life was spent as an inspector of schools, but for ten years he was also Professor of Poetry at Oxford. The poem we give here is one of his most delicate and fanciful pieces, and, although it is addressed to children, it will charm and engage us long after our childhood days are past.

THE FORSAKEN MERMAN

CONTINUED FROM 3277

COME, dear children, let us away;
Down and away below.
Now, my brothers, call from the bay;
Now the great winds shoreward blow;
Now the salt tides seaward flow;
Now the wild white horses play,
Champ and chafe, and toss in the spray.
Children, dear, let us away.
This way, this way!

Call her once before you go.
Call her once yet.
In a voice that she will know:
"Margaret! Margaret!"
Children's voices should be dear
(Call once more) to a mother's ear;
Children's voices, wild with pain.
Surely she will come again.
Call her once and come away,
This way, this way!
"Mother, dear, we cannot stay."
The wild white horses foam and fret.
Margaret! Margaret!

Come, dear children, come away down.
Call no more.
One last look at the white-walled town,
And the little grey church on the windy shore
Then come down.
She will not come though you call all day.
Come away, come away.

Children, dear, was it yesterday
We heard the sweet bells over the bay?
In the caverns where we lay,
Through the surf and through the swell,
The far-off sound of a silver bell?
Sand-strewn caverns, cool and deep,
Where the winds are all asleep;
Where the spent lights quiver and gleam;
Where the salt weed sways in the stream;
Where the sea-beasts, ranged all round,
Feed in the ooze of their pasture-ground;
Where the sea-snakes coil and twine,
Dry their mail, and bask in the brine;
Where great whales come sailing by,
Sail and sail, with unshut eye,
Round the world for ever and aye?
When did music come this way?
Children, dear, was it yesterday?

Children, dear, was it yesterday
(Call yet once) that she went away?
Once she sat with you and me,
On a red gold throne in the heart of the sea,
And the youngest sat on her knee.
She combed its bright hair, and she tended it well,
When down swung the sound of the far-off bell.
She sighed, she looked up through the clear green sea.
She said: "I must go, for my kinsfolk pray
In the little grey church on the shore to-day.
'Twill be Easter-time in the world—ah, me!
And I lose my poor soul, Merman, here with thee."
I said: "Go up, dear heart, through the waves.
Say thy prayer, and come back to the kind sea-caves."
She smiled, she went up through the surf in the bay.
Children, dear, was it yesterday?

Children, dear, were we long alone?
"The sea grows stormy, the little ones moan.
Long prayers," I said, "in the world they say.
Come," I said, and we rose through the surf in the bay.
We went up the beach, by the sandy down
Where the sea-stocks bloom, to the white-walled town.
Through the narrow, paved streets, where all was still,
To the little grey church in the windy hill.
From the church came a murmur of folk at their prayers,
But we stood without in the cold-blowing airs.
We climbed on the graves, on the stones worn with rains,
And we gazed up the aisle through the small leaded panes.
She sate by the pillar; we saw her clear;
"Margaret, hist! Come quick, we are here.
Dear heart," I said, "we are long alone.
The sea grows stormy, the little ones moan."
But, ah! she gave me never a look,
For her eyes were sealed to the holy book.
Loud prays the priest; shut stands the door.
Come away, children, call no more.
Come away, come down, call no more.

Down, down, down;
Down to the depths of the sea.
She sits at her wheel in the humming town,
Singing most joyfully.
Hark what she sings: "O joy, O joy,
For the humming street, and the child with its toy,
For the priest, and the bell, and the holy well,
For the wheel where I spun,
And the blessed light of the sun."
And so she sings her fill,
Singing most joyfully,
Till the shuttle falls from her hand,
And the whizzing wheel stands still.

She steals to the window, and looks at the sand;
And over the sand at the sea;
And her eyes are set in a stare,
And anon there breaks a sigh,
And anon there drops a tear,
From sorrow-clouded eye,
And a heart sorrow-laden,
A long, long sigh,
For the cold, strange eyes of a little Mermaiden,
And the gleam of her golden hair.

Come away, away children,
Come children, come down;
The hoarse wind blows colder;
Lights shine in the town.
She will start from her slumber
When gusts shake the door;
She will hear the winds howling,
Will hear the waves roar.
We shall see while above us
The waves roar and whirl,
A ceiling of amber,
A pavement of pearl.
Singing: "Here came a mortal,
But faithless was she;
And alone dwell for ever
The kings of the sea."

But, children, at midnight,
When soft the winds blow;
When clear falls the moonlight,
When spring-tides are low;
When sweet airs come seaward
From heaths starred with broom,
And high rocks throw mildly
On the blanched sands a gloom;
Up the still, glistening beaches,
Up the creeks we will hie;
Over banks of bright seaweed
The ebb-tide leaves dry.
We will gaze from the sand-hills
At the white, sleeping town,
At the church on the hillside—
And then come back down.
Singing: "There dwells a loved one,
But cruel is she;
She left lonely for ever
The kings of the sea."

CHERRY RIPE

This little lyric in praise of "Julia's" smiling lips was written by Robert Herrick, who was born in 1591, and died in 1674.

CHERRY ripe, ripe, ripe, I cry,
Full and fair ones—come and buy;
If so be you ask me where
They do grow—I answer, There,
Where my Julia's lips do smile—
There's the land, or cherry-isle;
Whose plantations fully show
All the year where cherries grow.

THERE'S ROOM AT THE TOP

"There's Room at the Top" was written by Mrs. Lilla T. Elder, an American poet. Mrs. Elder, who had children of her own, so thoroughly understood child nature that her verses cannot fail to be a source of delight to boys and girls of all ages. Several of her most charming poems will be found in different parts of the "Child's Book of Poetry."

THE hill of success may be steep, boys,
And hard work it may be to climb,
But the way grows smooth towards the top,
And it's only one step at a time. [boys;

Be sure you are honestly shod, boys;
Take the staff of self-help in your hand,
Watch out for the rough, rocky tread, boys,
And trust not to gravel or sand.

Look not far up into the clouds, boys,
Nor yet on the valley below,
But steadfastly, patiently, climb, boys,
Each step of the way learn to know.

Respect well the right of road, boys,
Let others more swift pass you by,
And fail not to hold out a hand, boys,
To all those who stumble and sigh.

There's plenty of room at the top, boys,
Though crowded the pathway and long,
And no one need fail in the end, boys,
If he's honest and patient and strong.

MY OLD KENTUCKY HOME, GOOD-NIGHT

This dear old folk-song of the South is well known throughout our broad land, and its author, Stephen Collins Foster, has written many such poems, whose homely sentiment has found for them a place in our hearts.

THE sun shines bright in the old Kentucky home;
'Tis summer, the darkeys are gay;
The corn-tops ripe, and the meadow's in the bloom,
While the birds make music all the day.
The young folks roll on the little cabin floor,
All merry, all happy and bright; [door;
By-'n-by hard time comes a-knocking at the
Then my old Kentucky home, good-night.
Weep no more, my lady,
O, weep no more to-day,
We will sing one song for the old Kentucky home,
For the old Kentucky home, far away.

They hunt no more for the 'possum and the coon,
On the meadow, the hill and the shore;
They sing no more by the glimmer of the
On the bench by the old cabin door. [moon,
The day goes by like a shadow o'er the heart,
With sorrow, where all was delight;
The time has come when the darkeys have to part:
Then my old Kentucky home, good-night.
The head must bow, and the back will have to bend,
Wherever the darkey may go;
A few more days, and the trouble all will end
In the field where the sugar-canes grow.
A few more days for to tote the weary load:
No matter, 't will never be light;
A few more days till we totter on the road:
Then my old Kentucky home, good-night.
Weep no more, my lady,
O, weep no more to-day;
We will sing one song for the old Kentucky home,
For the old Kentucky home, far away.

IF WE HAD BUT A DAY

"If We Had But a Day" was written by Mary Lowe Dickinson. How many of us have ever thought before how we would spend the time if we had but one day in which to live?

We should fill the hours with the sweetest things,
If we had but a day;
We should drink alone at the purest springs
In our upward way;
We should love with a lifetime's love in an hour
If the hours were few;
We should rest, not for dreams, but for fresher power
To be and to do.

We should waste no moments in weak regret
If the day were but one;
If what we remember and what we forget
Went out with the sun;
We should be from our clamorous selves set free
To work or to pray,
And to be what the Father would have us be,
If we had but one day.

SHE WALKS IN BEAUTY

Lord Byron, in this exquisite poem, has given us one of the most beautiful descriptions of a beautiful woman that has ever been written.

She walks in beauty like the night
Of cloudless climes and starry skies,
And all that's best of dark and bright
Meet in her aspect and her eyes;
Thus mellow'd to that tender light
Which heaven to gaudy day denies.

One shade the more, one ray the less,
Had half impaired the nameless grace
Which waves in every raven tress
Or softly lightens o'er her face,
Where thoughts serenely sweet express
How pure, how dear their dwelling-place.

And on that cheek, and o'er that brow
So soft, so calm, yet eloquent.
The smiles that win, the tints that glow,
But tell of days in goodness spent—
A mind at peace with all below,
A heart whose love is innocent.

SHE WAS A PHANTOM OF DELIGHT

Contrast these lines by William Wordsworth with those by Lord Byron. Both treat of the same subject, a lovely woman, and yet note how differently each poet approaches his theme.

She was a phantom of delight
When first she gleam'd upon my sight;
A lovely apparition sent
To be a moment's ornament;
Her eyes as stars of twilight fair;
Like twilight's, too, her dusky hair;
But all things else about her drawn
From May-time and the cheerful dawn;
A dancing shape, an image gay,
To haunt, to startle, and waylay.

I saw her upon nearer view,
A spirit, yet a woman, too.
Her household motions light and free,
And steps of virgin liberty;
A countenance in which did meet
Sweet records, promises as sweet;
A creature not too bright or good
For human nature's daily food,
For transient sorrows, simple wiles,
Praise, blame, love, kisses, tears, and smiles.

And now I see with eye serene
The very pulse of the machine;
A being breathing thoughtful breath,
A traveller between life and death;
The reason firm, the temperate will,
Endurance, foresight, strength, and skill;
A perfect woman, nobly plann'd
To warn, to comfort, and command;
And yet a spirit still, and bright,
With something of an angel light.

WILLIAM THE CONQUEROR

Charles Mackay, in these verses on William the Conqueror, seeks to illustrate for us that side of a great warrior's life which the historians too often neglect. We are not to suppose that William the Conqueror thought what the poet here suggests, but we know that with all his conquests he was not contented, and that probably some of the poor Saxon peasants whom he despised were happier in their quiet, dull lives than he.

Great King William spread before him
All his stores of wealth untold—
Diamonds, emeralds, and rubies,
Heaps on heaps of minted gold.
Mournfully he gazed upon it
As it glittered in the sun,
Sighing to himself, "Oh, treasure,
Held in care, by sorrow won!
Millions think me rich and happy;
But, alas! before me piled
I would give thee ten times over
For the slumbers of a child."

Great King William from his turret
Heard the martial trumpets blow;
Saw the crimson banners floating
Of a countless host below;
Saw their weapons flash in sunlight,
As the squadrons trod the sward;
And he sighed, "Oh, mighty army,
Hear thy miserable lord:
At my word thy legions gather,
At my nod thy captains bend;
But with all thy power and splendour,
I would give thee for a friend!"

Great King William stood on Windsor,
Looking from its castled height
O'er his widespread realm of England
Glittering in the morning light;
Looking on the tranquil river
And the forest waving free;
And he sighed: "Oh, land of beauty,
Fondled by the circling sea,
Mine thou art, but I would yield thee
And be happy could I gain,
In exchange, a peasant's garden,
And a conscience free from stain."

THE BUGLE

This beautiful poem by Lord Alfred Tennyson is taken from "The Princess." The rhythm so perfectly expresses the dying of the echoes into the distance, that we can almost hear them as they grow gradually fainter and fainter until all is quiet.

The splendour falls on castle walls
And snowy summits old in story:
The long light shakes across the lakes
And the wild cataract leaps in glory.
Blow, bugle, blow, set the wild echoes flying,
Blow, bugle; answer, echoes, dying, dying, dying.

Oh, hark! Oh, hear! How thin and clear,
And thinner, clearer, farther going!
O sweet and far, from cliff and scar,
The horns of Elfland faintly blowing!
Blow, let us hear the purple glens replying:
Blow, bugle; answer, echoes, dying, dying, dying.

O love, they die in yon rich sky,
They faint in hill or field or river;
Our echoes roll from soul to soul,
And grow for ever and for ever.
Blow, bugle, blow, set the wild echoes flying,
And answer echoes, answer, dying, dying, dying.

THE FAIRY TEMPTER

Samuel Lover, the Irish poet and novelist, is the author of this charming fairy poem. It is a beautiful fancy, with a lesson for all of us—not to be tempted by fair promises from the path of duty, which is always plain if not always inviting.

A FAIR girl was sitting in the greenwood shade,
List'ning to the music the spring birds made;
When sweeter by far than the birds on the tree
A voice murmured near her: "Oh, come, love, with me—
In earth or air,
A thing so fair
I have not seen as thee!
Then come, love, with me."

"With a star for thy home, in a palace of light,
Thou wilt add a fresh grace to the beauty of night;
Or, if wealth be thy wish, thine are treasures untold,
I will show thee the birthplace of jewels and gold—
And pearly caves
Beneath the waves—
All these, all these are thine,
If thou wilt be mine."

Thus whispered a fairy to tempt the fair girl,
But vain was the promise of gold and of pearl;
For she said: "Tho' thy gifts to a poor girl were dear,
My father, my mother, my sisters are here—
Oh, what would be
Thy gifts to me
Of earth, and sea, and air
If my heart were not there?"

THE MOTHER TO HER INFANT

We have already read a number of short pieces by Thomas Miller on the sights and sounds of natural life. In the following his theme is taken from human nature, and he touches a familiar domestic subject with real feeling.

SLUMBER, my darling, no danger is near,
Thy mother sits by thee to guard thy repose;
Though the wind roars aloud, not a breath reaches here,
To shake the white curtains which round thee do close:
Then slumber, my darling, and sleep without fear,
Thou art safe from all danger, my dearest, while here.

What is it the angels do unto thee say,
When thou dost lie smiling so sweet in thy sleep?
Are they trying, my sweetest, to lure thee away,
And leave me alone in my sorrow to weep?
Oh, sometimes I fancy they whisper thy name,
And would fain bear thee back to the land whence they came.

Then never, my darling, when thou growest old,
Forget her who on thy sweet infancy smiled,
To whom thou wert dearer than jewels and gold,
Who studied thy looks and thy wishes, my child,
Who, when thou didst need her, was never away,
In health or in sickness, by night or by day.

THE SNOW-STORM

ANNOUNCED by all the trumpets of the sky,
Arrives the snow, and, driving o'er the fields,
Seems nowhere to alight: the whited air
Hides hills and woods, the river, and the heav'n,
And veils the farm-house at the garden's end.
The sled and traveller stopped, the courier's feet
Delayed, all friends shut out, the housemates sit
Around the radiant fireplace, enclosed
In a tumultuous privacy of storm.

Come see the north wind's masonry.
Out of an unseen quarry evermore
Furnished with tile, the fierce artificer
Curves his white bastions with projected roof
Round every windward stake, or tree, or door.
Speeding, the myriad-handed, his wild work
So fanciful, so savage, naught cares he
For number or proportion. Mockingly,
On coop or kennel he hangs Parian wreaths;
A swan-like form invests the hidden thorn;
Fills up the farmer's lane from wall to wall,
Maugre the farmer's sighs; and at the gate
A tapering turret overtops the work.
And when his hours are numbered, and the world
Is all his own, retiring as he were not,
Leaves, when the sun appears, astonished Art
To mimic in slow structures, stone by stone,
Built in an age, the mad wind's night-work,
The frolic architecture of the snow.

—RALPH WALDO EMERSON.

YOUNG AND OLD

Charles Kingsley in these oft-quoted verses sets down a whole lifetime of experience. By the quick contrast of the gay days of youth and the grey days of later life he conveys a feeling no amount of prose writing could express.

WHEN all the world is young, lad,
And all the trees are green;
And every goose a swan, lad,
And every lass a queen;
Then hey for boot and horse, lad,
And round the world away;
Young blood must have its course, lad,
And every dog his day.

When all the world is old, lad,
And all the trees are brown;
And all the sport is stale, lad,
And all the wheels run down;
Creep home, and take your place there,
The spent and maimed among;
God grant you find one face there
You loved when all was young.

SOUND LOUD THE CLARION

These four lines of verse by the great Sir Walter Scott are frequently quoted and well worth committing to memory.

SOUND, sound the clarion, fill the fife!
To all the sensual world proclaim,
One crowded hour of glorious life
Is worth an age without a name.

LITTLE VERSES FOR VERY LITTLE PEOPLE

AWAY, birds, away!
Take a little, and leave a little,
And do not come again;
For if you do,
I will shoot you through,
And there is an end of you.

OH, ring the bells! Oh, ring the bells!
We bid you, sirs, good-morning;
Give thanks, we pray—our flowers are gay,
And fair for your adorning.
Oh, ring the bells! Oh, ring the bells!
Good sirs, accept our greeting;
Where we have been, the woods are green,
So, hey, for our next meeting.
Then ring the bells! Then ring the bells!
For this fair time of Maying;
Our blooms we bring, and while we sing,
Oh, hark to what we're saying.
Oh, ring the bells! Oh, ring the bells!
We'll sing a song with any;
And may each year bring *you* good cheer,
And each of *us* a penny.

"SHALL I sing?" says the Lark,
"Shall I bloom?" says the Flower;
"Shall I come?" says the Sun,
"Or shall I?" says the Shower.
Sing your song, pretty Bird,
Roses, bloom for an hour;
Shine on, dearest Sun,
Go away, naughty Shower.

"BARBER, barber, shave a pig,
How many hairs will make a wig?"
"Four and twenty, that's enough."
Give the barber a pinch of snuff.

HERE'S Sulky Sue;
What shall we do?
Turn her face to the wall
Till she comes to.

"How do you do, neighbour?
Neighbour, how do you do?"
"Very well, I thank you.
How does Cousin Sue do?"
"She is very well,
And sends her love to you,
And so does Cousin Bell."
"Ah! how, pray, does she do?"

"BILLY, Billy, come and play,
While the sun shines bright as day."
"Yes, my Polly, so I will,
For I love to please you still."
"Billy, Billy, have you seen
Sam and Betsy on the green?"
"Yes, my Poll, I saw them pass,
Skipping o'er the new-mown grass."
"Billy, Billy, come along,
And I will sing a pretty song."
"Oh, then, Polly, I'll make haste,
Not one moment will I waste,
But will come and hear you sing,
And my fiddle I will bring."

DAME TROT and her cat
Sat down for to chat;
The Dame sat on this side,
And Puss sat on that.

"Puss," says the Dame,
"Can you catch a rat
Or a mouse in the dark?"
"Purr," says the cat.

"BUY me a milking-pail,
Mother, mother."
"Betsy's gone a-milking,
Beautiful daughter."

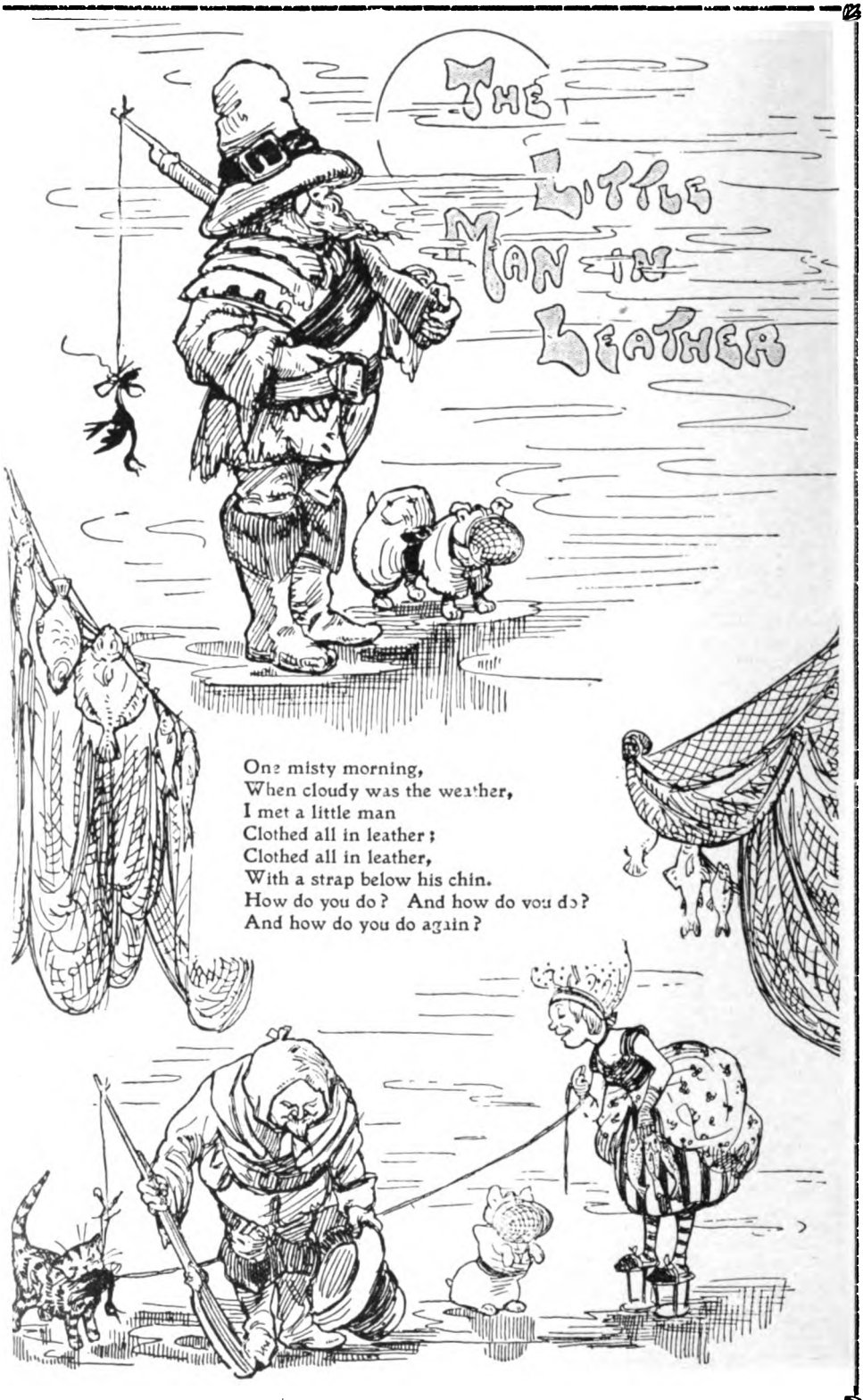
"Sell my father's feather bed,
Mother, mother."
"Where will your father lie,
Beautiful daughter?"

"Put him in the boys' bed,
Mother, mother."
"Where will the boys lie,
Beautiful daughter?"

"Put them in the pigs' sty,
Mother, mother."
"Where will the pigs lie,
Beautiful daughter?"

"Put them in the salting-tub,
Mother, mother.
Put them in the salting-tub,
Mother, mother."

THE robin and the red-breast,
The robin and the wren;
If ye take from their nest,
Ye'll never thrive again!
The robin and the red-breast,
The martin and the swallow;
If ye touch one of their eggs,
Bad luck will surely follow.



An everyday scene in one of the sunny streets of the great Spanish seaport of Barcelona

SPAIN AND PORTUGAL

CONTINUED FROM 3226

ONE of the oldest fairy stories in the world tells us about the travels and deeds of a certain strong and daring giant, on his way from end to end of the Mediterranean Sea. The story was an old one when Greek children listened to it over 2,000 years ago. With the shining blue sea dancing before their eyes, it was easy for them to follow the hero, in imagination, to its very farthest end, where Africa and Europe nearly meet. For here, so the story says, to show how far he had gone, the mighty Hercules raised two huge rocks called " the Pillars of Hercules," and they stand to this day, one on each side of the narrow straits, just nine miles across, where the sea joins the ocean.

The far-famed rock on the European side, over 1,000 feet high, stands like a guard near the extreme south point of the Iberian Peninsula.

This great mass of land, now comprising the large kingdom of Spain, and the smaller one of Portugal is, roughly speaking, about 500 miles square, and it lies on the south-west corner of Europe between the Mediterranean and the Atlantic; the grand and rugged Pyrenees form its only land frontier. It has been said that Europe ends at the Pyrenees, so different in many ways is the country beyond them from the rest of the Continent. It is true that its Mediterranean shores, in their beauty and fertility, remind us of the shores of the other two southern peninsulas; and the coasts of the Atlantic and the Bay of Biscay can be matched in the West of France and the British Isles. It is the centre, the inner part—that is to say, three-quarters of the whole Iberian Peninsula—that is more like Africa than Europe. This part is pushed up, as it were, some two to three thousand feet above the sea-level, and across this tableland or high plateau run several ranges of mountains, regular like the teeth of a saw, generally in an easterly and westerly direction, some thousands of feet higher still. Between these high ranges run most of the chief rivers draining to the Atlantic.

Bare, and bleak, and rugged, is most of this inland scenery, in strong contrast to the loveliness and warmth of that of the Mediterranean coast and of the three chief plains of the country. These plains lie in river valleys, one in that of the Ebro, which flows into the Mediterranean between the Pyrenees and the Iberian mountains; another in the valley of the

Guadalquiver, between the Sierra Nevada and the Sierra Morena; and the third is found along the western Atlantic shore, widening to the south between the lower courses of the Tagus and the Guadiana. The courses of these rivers of the plains present another contrast, for high up on the plateau where they rise, they flow, generally speaking, deep down in gorges, between rocky cliffs, useless for watering the land or for serving as routes.

The peninsula furnishes yet another sharp contrast in the matter of its rainfall. The lands bordering on the Bay of Biscay are the wettest in Europe; those on the central plateau are the driest, for the high Cantabrian mountains, the continuation of the Pyrenees along the coast, seize the moisture of the wet west winds—as our mountains do in the West—and the valleys of the deep northward slopes, falling 9,000 feet to the sea, are green and beautiful, growing many crops. Ferns and flowers abound, also all sorts of fruit-trees, ripening in the mild climate.

THE SUDDEN STORMS THAT SWEEP OVER THE SPANISH TABLELANDS

On the lofty tablelands on the other side of the mountains, which are only 2,000 feet below the peaks, the rain comes in occasional and sudden storms; so that at times the small rivers are dried up, while at other times the larger ones are apt to race unexpectedly down their rocky beds in swollen floods. Hot winds, too, blow at certain seasons over the plateau from Africa, and so we find scarcely any forests or crops upon it. Many sheep and goats of famous breeds feed upon the close pastures, shut in by the teeth-like mountainous walls so bare and rocky.

Round the straight coast of the Iberian Peninsula there is no fringe of lovely islands like those around the Balkan Peninsula; but we have the continuation of the range of the Sierra Nevada reappearing above the sea to the east as the Balearic Islands, often fought for by the surrounding peoples, though intended by Nature to belong to Spain. On them grow the same fruits and crops as flourish so well round the neighbouring coasts. The people who live to-day in the corner lands of the Bay of Biscay say proudly that they are of the oldest race in Europe. They are the descendants of the earliest known people in the peninsula, the Iberians, who have given their name to it. They have always been distinguished for their passionate love of independence during the changes that have occurred in the passing centuries.

THE OLD ROMAN CITIES THAT HAVE BECOME GREAT AND FAMOUS

The Romans were the conquerors of the Iberians and the Kelts, who came later and mixed with them, and many are the traces of their long stay in the land. Naturally, they settled much along the coast closest to Italy, and many of the cities famous to-day date from Roman times. There is Barcelona, with its beautiful clear air and fine climate; Saragossa, inland, is in the centre of the valley of the Ebro; Valencia, whose beauty has given rise to the saying: "You would take it for a piece of heaven upon earth." Toledo is on the Tagus, that "cuts out" its course on one of the Roman roads of the interior; and to the south, on the Guadalquiver, the "great river," rose up the splendid towns of Seville and Cordova. All these belonged to Hispania, whence we get the name Spain.

But it was in the province of Lusitania, formed round about the lower courses of the Douro, the Tagus, and the Guadiana, that Merida, the Rome of Spain, rose up in its grandeur. Here are still to be seen fine ruins of an amphitheatre, a circus, and an aqueduct, and to the north, over the wild rock-walled Tagus, is one of the grandest old bridges in the world. It is half as long again as Waterloo Bridge over the Thames, grey and stained with the weather of seventeen centuries. But the nation of soldiers and builders had to leave the fine roads and the camps, the cities and monuments of the peninsula, as they had to do in Britain and Gaul, when the empire began to grow weaker.

THE FIERCE TRIBES THAT POURED DOWN UPON SPAIN FROM THE NORTH

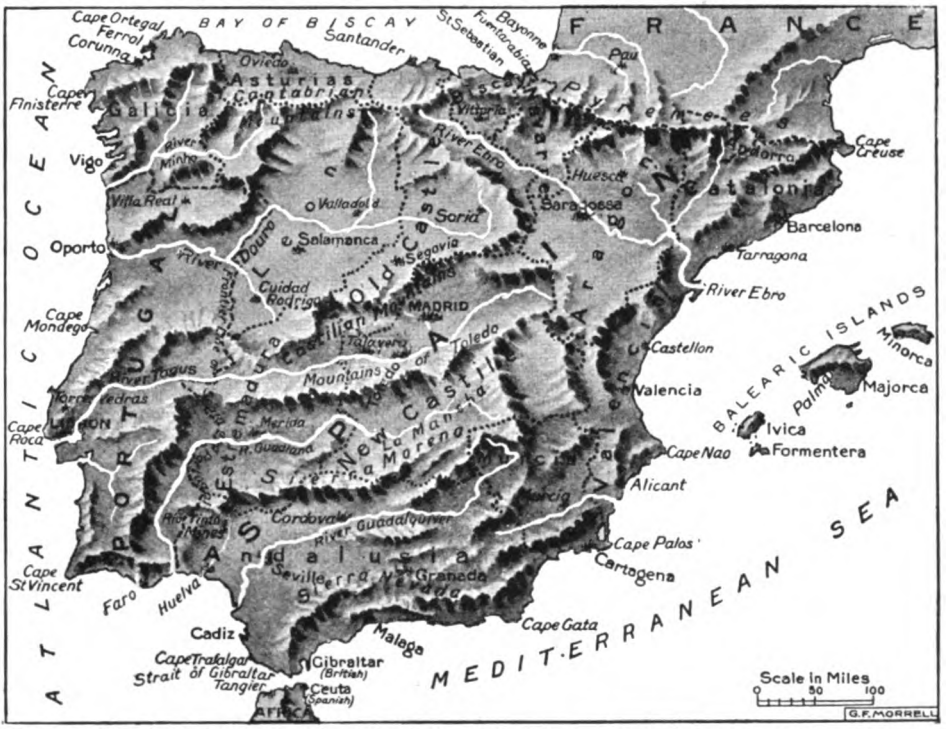
Hordes of German tribes, among them the Goths and Vandals, poured down from the north and took possession of nearly the whole of the peninsula. By degrees the Goths gave up their fierce religion for Christianity, and churches and monasteries rose up over the country as the people became more civilised. But with civilisation their character

seemed to grow weaker. There were many Gothic kings, some of whom held sway over the states that were forming, as the years went by, more or less on the lines of the Roman provinces.

Some of the states did not grow into shape till later on, though, broadly speaking, the provinces of to-day are survivals of the old states and kingdoms, and in most cases their great cities and towns were the old Roman capitals.

Catalonia, with its capital, Barcelona, Valencia and Murcia lie on the fertile central plateau, and Aragon is in the upper valley of the Ebro, with Saragossa for its capital.

The rule of the Christian Gothic kings over most of these states came to a sudden and tragic end at the beginning of the eighth century. Over the sea from Africa came a great host, sailing under a crescent banner; their watchword was "God is great, and Mohammed is His prophet." They poured into the peninsula under the shadow of the great Pillar of Hercules, that we call Gibraltar



The Spanish Peninsula juts out into the Atlantic, the most westerly part of all Europe. At its southernmost point it nearly touches Africa, and the narrow Straits of Gibraltar are commanded by the great guns of an impregnable rock fortress. No other country in Europe has a finer soil and climate, and yet half Spain lies uncultivated.

east coast; and Andalusia, with its host of great towns, is on the south. These are the garden provinces of Spain, famous for flowers and palms, grapes and olives, oranges and lemons.

Portugal, on the lower Lusitanian Atlantic seaboard, stretches right up to Galicia in one broad strip. Cape Finisterre, the end of the Roman land, lies on the rocky coast of Galicia, sometimes called the Switzerland of Spain, and to the east of this land of independent spirited mountaineers lies Leon, named after the seventh Roman legion.

Old and New Castile are on the now, from Gebel-Tarik, the Rock of Tarik, who was the leader of these Mohammedan Saracens or Moors. They landed in 711, and in the course of a few years the Moors spread nearly all over the peninsula, and on through the passes of the Pyrenees, over the fair plains of France as far as Tours. Here they were stopped by Charles of the Hammer, and the Mohammedan wave, which might have spread over Northern Europe, and even across the Channel, was turned back southwards by this victory, across the mountain barrier whence it had come. It was nearly 800

years before the power of the Moors came to an end in the peninsula itself.

Many champions rose up, and great efforts were made through the centuries to dislodge the "Pagans," the "Infidels," as the Christians called the Moors, who were equally anxious to spread the worship of Mohammed by crushing out the Christians. We know how Charlemagne, grandson of Charles of the Hammer, came fighting to the rescue, and how his nephew Roland made a most heroic retreat through the gloomy pass in the Pyrenees. Later, the great national hero, the Cid, or Conqueror, performed surprising feats against the Moors, which, like those of Roland, are the subjects of many favourite stories. Some English Crusaders came, too, and found pleasure and adventure in helping on the struggle. But for a long time the Moors held their own. Besides being warlike and fearless in spreading their faith, they were industrious and clever. They understood how to use rivers to water and fertilise dry soil. They were splendid gardeners, and introduced all sorts of new trees and flowers.

THE WARLIKE MOORS, WHO MADE SPAIN A FAIRYLAND OF GARDENS AND PALACES

But, above all, they were wonderful builders. As we travel over the peninsula to-day, amongst the greatest marvels that we see are the remains of Moorish buildings; their palaces and mosques, and the fortresses and castles which were built across the central highlands, are amongst the wonders of the world.

The foothold for the eventual reconquering of the country by the Christians was on the north. From the highlands of the Pyrenees and the Cantabrian mountains, the Moors were driven first over the Ebro valley. Then the kingdoms of Leon, Castile, Aragon slowly extended their borders. We read, elsewhere, the story of the princess of Castile who married an English prince, and went with him to the Crusades. Next, Leon and Castile gained power by union, and the Moors had to retreat over the high plains and across Andalusia into the south. Their last province was Granada, which they held for another two centuries. During this time most of the Christian states were drawing closer together on their way to become one united Spanish kingdom. But Portugal stood alone. The Spanish and Portuguese people belong to much the same stock, and so do their languages. Geographically, there was no reason why this Atlantic province should remain distinct and independent when the others tended to unite. There is no natural division line between it and the rest of the peninsula.

HOW THE SEA CALLED THE PORTUGUESE TO CONQUEST AND DISCOVERY

Its mountains are the ends of the ranges of Spain; its chief rivers are the useful lower courses of the rivers of Spain. It had been overrun by the Germanic tribes like the rest of the peninsula, invaded by the Moors in the eighth century, reconquered from them by Castile, and it had been able, one hundred years later, to set up the first of its independent kings.

Half the Portuguese boundaries are the rolling waves of the Atlantic, and when the kingdom had settled down a little there were leisure and opportunity to listen to the insistent call of the sea, which is ever felt by those who dwell beside it; so they built ships fit for more than coast voyages. The story of how the Portuguese enlarged their borders over the neighbouring western islands and onwards, and how they showed the way to India round the Cape of Good Hope, we read elsewhere. Prince Henry, the Navigator, who did so much to encourage the explorers, was the grandson of an Englishwoman, Philippa of Gaunt, who was granddaughter of the old warrior Edward III. and his good queen, Philippa, whose story we read elsewhere.

Portuguese sailors also found their way to Brazil, where later rich mines of gold and diamonds brought great wealth to the little mother country. It was about this time that Lisbon, so beautifully situated on the fine harbour at the mouth of the Tagus, became one of the richest cities in Europe; and Oporto, another great harbour on the Douro, began to grow rich from trade with distant parts.

THE KING AND QUEEN WHO MADE SPAIN ONE COUNTRY

Spain was not slow in following Portugal to enterprising discoveries and conquests far beyond Europe. In the picture on another page we see the two sovereigns, Ferdinand of Aragon and

THE ENEMIES OF SPAIN IN RETREAT

For nearly 800 years the Moors ruled in Spain, but gradually they were pressed back, until at last, in 1492, their last stronghold, Granada, surrendered. Here we see King Ferdinand and Queen Isabella receiving the keys of the city from the last of the Moorish kings, who, as he looked back upon the towers he had left for ever, wept bitterly. The rock from which he took this final look is still known as "the Last Sigh of the Moor."

When Napoleon forced his brother Joseph upon the Spaniards as their king, they rose in revolt against the French army that had invaded their country. The English, under Wellington, went to the help of Spain, and the fierce Peninsular War was the result. After much fighting Wellington inflicted a crushing defeat upon the French at Vittoria, and the French left the town a mere flying mob, as shown in this picture by R. Hillingford. **Joseph Bonaparte only just escaped, leaving his carriage and even his private papers behind.**

Isabella of Castile, whose story is told on page 2367, listening to Columbus. It was the marriage of Ferdinand and Isabella that united their kingdoms, and made it possible to gather enough strength together to displace the Moors from Granada, and thus bring the Moorish dominion to an end.

What exciting times they were! Columbus was pleading so anxiously for help and men to cross the seas, and Isabella herself, dressed in armour, was in the midst of the army, while the siege of Granada was going on. The tent in which were the royal children was knocked over, and they nearly fell into the hands of the Moors. Little Catherine was there, who grew up to be the wife of Henry VIII., so familiar to us in English history as the dignified and unfortunate Catherine of Aragon. In later years, when sad and ill in a damp, grey country, how often must Catherine have thought of the bright home of her childhood, with its sunshine and white-crested mountains. In the cathedral of Granada are still to be seen pictures, statues, and personal belongings illustrating those years, and amongst them is a banner worked by Isabella, which was hoisted over the conquered city when the Moors left.

THE FAIRY PALACE ON A HILL, WHOSE WALLS ARE LIKE LACE

For it became the favourite residence of Catherine's parents, and great was their interest and delight in the magnificent palace that had been built on a hill close by the city by generations of Moorish kings. The Court of the Alhambra at the Crystal Palace gives some idea of the wonders of Moorish decoration, and many travellers to Spain have recorded their delight at the glories of the numberless courts and galleries, the halls and lovely gardens with marble baths and fountains, of this wonderful spot. All is so beautifully painted and carved that the walls seem "woven like a cloth, rich as brocade, transparent as lace, and veined like a leaf." By moonlight especially it is a true fairy palace. All the decay of centuries seems to disappear under the soft silvery beams glancing through the fretwork and windows and flooding the open spaces. It all seems like a living enchantment straight from the romantic times of the Arabian Nights. And this is by no means the only beautiful relic from Moorish times. In Seville there is a palace in which the Hall of the Ambassadors is one blaze of lovely colours from the marble floor to the mother-of-pearl and crystal roof.

THE PINK TOWER OF PRAYER, FROM WHICH MEN WATCHED THE STARS

Here is also the wonderful tower, called the Giralda, built by the Moors as a prayer-tower, and for an observatory from which to watch the stars. Its colour is a delicate pink; the view from the top of the bends of the Guadalquiver, amongst the sunny green plains, is most exquisite.

Both Catherine and her sister Joanna must have enjoyed all this beauty in their young days. It was the son of Joanna who became Charles I. of Spain, famous in history as the Emperor Charles V. He was ruler not only over a large part of Europe, but of an immense dominion across the ocean, for in his reign Mexico, Chili, and Peru were added to the already large and rich belongings of Spain in the West Indies. This great sovereign paid a long visit to his aunt in England, and it was his son Philip who married her daughter, Mary Tudor, the year after she became Queen of England.

This marriage was very unpopular, for English people were afraid that liberty, chiefly in the matter of religion, would be crushed by the same methods as in the bridegroom's country. In his grandparents' time a Court had been formed with powers to inquire about everyone's faith, and to punish all who did not agree with the Church of Rome, to which, as a nation, the Spanish have always been very firmly devoted. At first it was directed against the Mohammedan Moors and the Jews; but when, in Reformation times, men began to assert their rights to worship God in the way they believed right, all the terrors and cruelties of the Court were directed against them.

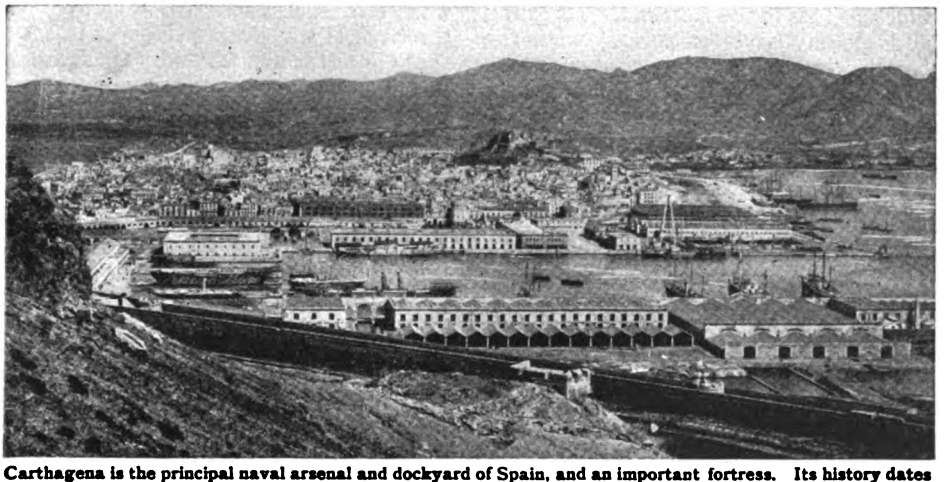
HOW THE LITTLE TOWN OF MADRID BECAME THE CAPITAL OF A MIGHTY EMPIRE

This Court of the Inquisition was busy in Philip's reign, not only in his own country, but in the Netherlands, and many people were tortured and burnt because they would not return to the old faith. It was this Philip II. who chose Madrid, then but a small town, to be

IMPORTANT CITIES OF SPAIN & PORTUGAL

Cadiz, one of the most important commercial cities and naval centres of Spain, was founded 3,000 years ago by the Phœnicians. It has a splendid harbour, and twice in the 16th century the English seized and burnt the shipping.

Oporto, the second city of Portugal, stands on the steep, rocky bank of the river Douro, three miles from the sea, and has a large trade. It is the principal place of export for port wine, which really means Oporto wine.



Carthagena is the principal naval arsenal and dockyard of Spain, and an important fortress. Its history dates back to 223 B.C., when it was founded by Hasdrubal, the Carthaginian general, who called it New Carthage.

the capital of the newly united kingdom of Spain. It is near the centre of the peninsula, and is now one of the finest cities of Europe, though it has no natural advantages for a capital, beyond its central position. It is on a high, bleak plateau, dry and shadeless, surrounded by grey rocky mountains. It has no navigable river; communication with the rest of the country was long difficult. Its climate is unbearably hot in summer, and piercingly cold in winter.

THE PRICELESS ART TREASURES THAT ARE STORED UP IN MADRID

Ever since Philip's day magnificent buildings have been erected by succeeding sovereigns. It would take months to see all the splendid pictures, not only of Spain's greatest artists such as Velasquez, of whom we read on page 760, and Murillo, but of the masters of Italy. We can find illustrations for all Spanish history in the galleries as well as in the National Museum, and in the famous collection of arms and armour. Here are the swords of Spain's noblest champions, of Roland and of the Cid; here are banners and tents taken from the enemy, from the times of the Goths and Moors; and amongst many other most deeply interesting things there is a suit of armour belonging to Philip II., with the arms of England engraved upon it, which he wore when he sat for his portrait to the great artist Titian.

About thirty miles away from the new capital, Philip built a country residence for himself, and joined to it a monastery, a church, and a burial vault for Spain's royalty, all in one enormous block. This is the Escurial. Its grand and gloomy style suits well with the bare, rocky country in which it is placed. Philip said he wanted only a cell in which to rest his weary body, but his successors have beautified and enlarged the buildings in every possible way.

HOW KING PHILIP SAT SILENT WHEN HE HEARD NEWS OF A GREAT VICTORY

The seat in the church occupied by Philip when the news was brought to him of the victory of Lepanto, of which we read in our book, is still shown. It is said that he remained impassive till the end of the service, and then he ordered a solemn thanksgiving to be sung. The good news of this check to the sea-power of the Turks had taken just a month to come from the coast of Greece. Though in many respects the reign of Philip was the time of Spain's greatest riches and glory, he had many troubles, too; and his face looks weary enough in his portrait in the National Portrait Gallery, in London, which describes him as "King of England." The loss of the gallant Armada, with the failure of his plans upon England, was a bitter blow, and the constant "singeing of his beard" by the daring sea-rovers of that country must have been very trying.

To the south of Madrid is the district of La Mancha, made famous by Cervantes, who lived about these times, in his celebrated story of Don Quixote, which we read in another place. Here there are still old windmills to be seen waving their long arms over the dreary-looking country.

It was in Philip's days that Portugal fell to Spain, and remained united with her for sixty years, after which it reasserted its independence. The daughter of the first of its new line of kings was Catherine of Braganza, the wife of Charles II. Part of her marriage dower was Bombay, which proved to be an important foothold for England in India.

BRITAIN'S ROCK FORTRESS THAT GUARDS THE ENTRANCE TO THE MEDITERRANEAN

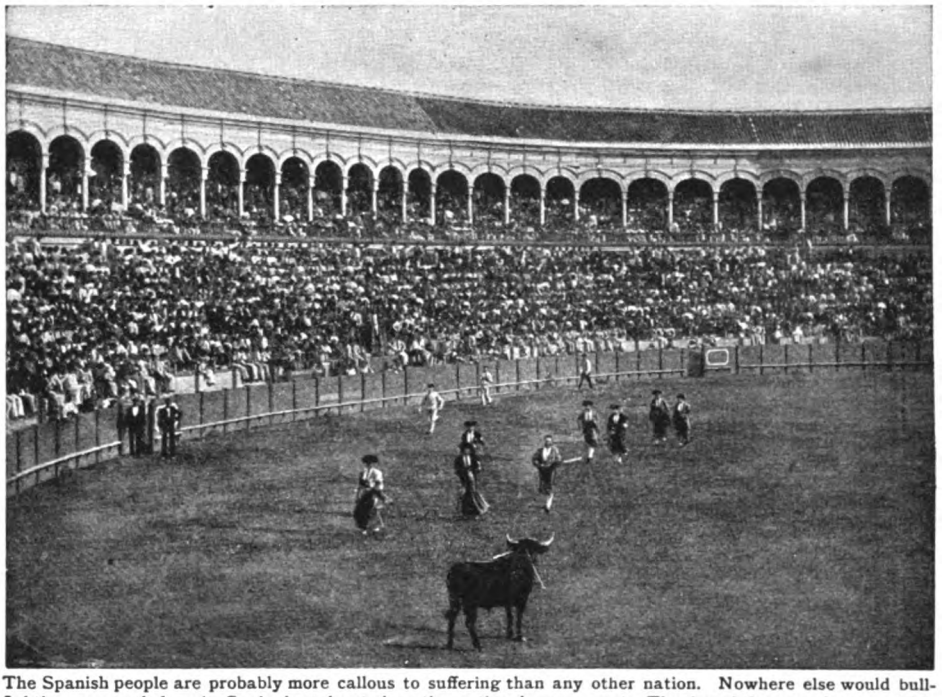
Soon after Portugal was lost to Spain, the Netherlands succeeded in shaking off Spain's heavy yoke. After this came endless years of war between Spain, France, Austria, and England, during which time Louis XIV. was for long a central figure.

One of the chief subjects of dispute was the succession to the Spanish throne. It was during this war in 1704 that Gibraltar was taken by the British. It withstood a tremendous siege about sixty years later. It is still the British flag that waves over this Pillar of Hercules guarding the entrance to the Mediterranean Sea and the route to India by the Suez Canal.

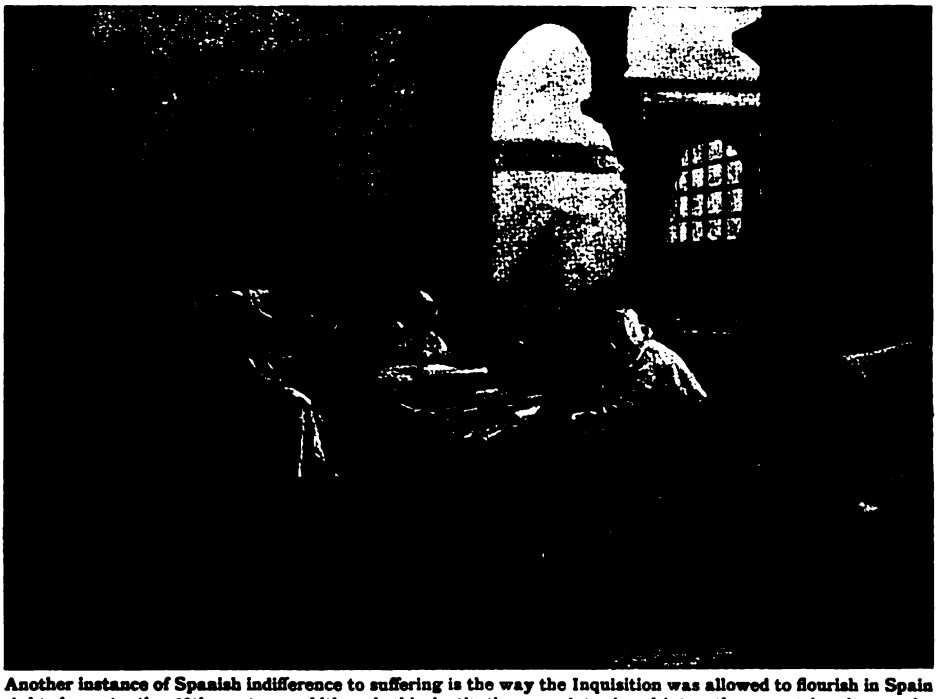
The famous "wooden walls" of Old England were frequently seen in those days cruising about the approach to the Straits of Gibraltar. Two years before the great siege of the Rock, a victory was won over France, helped by Spain, off Cape St. Vincent. It was the same year that saw Lombardy conquered by Napoleon.

A few years later the fleets met again near the same part of the coast. This

THE CRUELLEST SPORT IN THE WORLD



The Spanish people are probably more callous to suffering than any other nation. Nowhere else would bull-fighting, as carried on in Spain, be tolerated as the national amusement. The thoughtless people around this **arena are amused by the sight of suffering. The sufferings of the bull, in a fight, are as nothing compared with those of the horse. Here we see the close of a bull-fight, with the matador about to kill the bull.**



Another instance of Spanish indifference to suffering is the way the Inquisition was allowed to flourish in Spain right down to the 19th century. Although this institution was introduced into other countries, it was the terrible Spanish Inquisition that became a by-word for much that is shocking in history. Terrible tortures were inflicted by the Inquisition, and in this picture we see the stern Inquisitors waiting for the next heretics.

time it was off Cape Trafalgar, and on October 21, 1805, Nelson won his last and most famous victory. But, in spite of this and other checks by sea, Napoleon went his own victorious way by land in Prussia, Italy, Holland, and then came the turn of the peninsula. Some first aggressions having been passed over, France tempted Spain to agree to divide Portugal between them.

How the Old World was Ruled from the New World

The Portuguese royal family and the Court fled in alarm over the sea to their great possessions in Brazil, and for many years this European state was ruled from the New World. But before long Napoleon took advantage of the quarrel between the King of Spain and his son, and a French army entered Madrid and proclaimed Joseph Bonaparte king.

But all Spain rose at this action of Napoleon, and England, in indignation and alarm, quickly sent out supplies and two small armies under Sir John Moore and Sir Arthur Wellesley—who later became Duke of Wellington—to help to make a stand for the independence of the two kingdoms in the peninsula. For six years the war spread itself over the high tableland so difficult to cross and so trying in its extremes of climate. Heroic defences were made, and the peasants who lived in the little grey villages were always ready to rush out and harass the French. The defenders had some success in both Portugal and Spain, and then the tide was turned by the appearance of Napoleon himself. It is about 100 years ago that Sir John Moore made a masterly retreat to Corunna in Galicia, where he lost his own life, but saved the honour of his troops. After this, Northern and Central Spain fell into the hands of France. Wellington, with fresh troops, gained a victory at Talavera which restored the fame of English arms. His next work was to wait patiently, holding his ground in the three famous lines of defence which he threw up at Torres Vedras, near Lisbon.

Napoleon's Vain Boast and How His Army was Driven Out of Spain

At last his patience was rewarded, the French general had to give up trying to drive Wellington out of Portugal, and then the chance came of doing something in Spain. Napoleon had been obliged to draw away some of his best old soldiers to help in the war with Russia, and, in consequence, many towns in Spain were won back, and Joseph was forced to leave Madrid. So was rendered vain Napoleon's boast, "I hold it at length, this Spain so greatly desired," which he uttered as he put his hand on one of the white marble lions, going down the grand staircase in the Royal Palace of Madrid. Finally, after many ups and downs, the French were driven, after the defeat of Vittoria, across the Pyrenees. Months before that, the veterans who had so long held Spain for Napoleon lay frozen dead on the bitter road from Moscow.

The nineteenth century was a troublous one for Spain. By degrees she lost most of the colonies that had enriched her so much in the past. Peru, Mexico, and Cuba became independent, Florida was sold, and the Philippines passed to the United States of America. There were also many disputes about the succession to the crown and the form of government, which led to civil wars and constant changes which nearly ruined the country.

The Building Up of Spain under its Young King and his English Queen

But now things are more settled. The constitution—for long a mere name—is duly observed. The young king, Alphonso XIII., has married an English princess, and they have three children. Prosperity is increasing, as railways, which are very difficult and expensive to build in the central plateau, are gradually stretching over the country. Agriculture is improving, and more attention is being paid to mining and manufactures. Spain is very rich in metals; iron and coal are worked in the north, and the famous mines of Rio Tinto in the south supply a quarter of the world's copper.

Portugal had also had many civil wars and difficulties to contend with in the nineteenth century, and Brazil became independent; but once more the gallant little country, so firm an ally of Great Britain through the years, is reviving under happier conditions. For size and population Portugal may be compared to Ireland.

The capital of Portugal—Lisbon—was almost destroyed by a terrible earthquake in 1755, but it is now rebuilt, and is a beautiful and interesting city,

doing a great deal of trade. From Oporto comes the wine known as port.

Many visitors go to Spain not only to enjoy the fine climate round the coast, but to see the grand old towns which show so many traces of the history of the country.

We have already glanced at the relics of the Romans and of the Moors. Belonging to the Christian times are magnificent cathedrals in nearly every city, and rich treasures of pictures.

The beautiful Moorish Giralda Tower in Seville is now the belfry tower of the splendid cathedral—the largest in Spain, famous for its rich sculpture and fine pictures. It is said that there is never a day in Seville when the sun does not shine; everything is bright and gay, the golden oranges, brilliant flowers, glossy palms, and white houses, with their pretty courtyards. Though the city is about sixty miles from the sea, fair-sized vessels can pass up the river and unload on the quay. After the return of Columbus from his first voyage, the city had a great trade with the Indies. In Seville are thousands of girls making cigars and cigarettes, and the dark little boys running about the streets might have been models for Murillo. Both the artists Murillo and Velasquez were born at Seville.

Cordova, also on the Guadalquiver, was once the greatest city of the Moors, and the wonderful cathedral was once their chief mosque. A thousand columns of beautiful marble support the roof, and look like a forest of stone.

Toledo has a grand position on a rocky height, round the base of which the Tagus circles. Its cathedral is very large and rich, and at every corner of the ancient city are reminders of its strange and wonderful past.

The old Roman Barcelona has grown into a city ten times as large, and is now the first port in Spain, standing on one of the most lovely sites on the Mediterranean shores. It is often called the Liverpool of Spain from its numerous manufactures and busy commerce. There is a fine view of the harbour, always full of shipping, from the lofty monument to Columbus. His figure on a golden ball is 23 feet high. It stands opposite the handsome street called the Rambla, shaded by trees, like the Unter den Linden at Berlin. There is also a handsome cathedral.

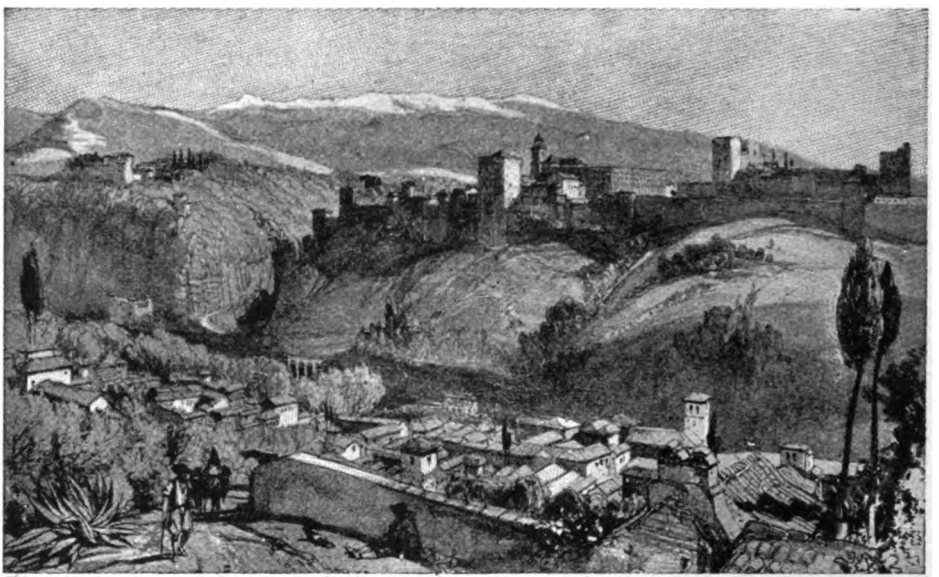
Cadiz, most picturesquely situated on a rocky peninsula, with beautiful bays and harbours, is sometimes called the Venice of Spain. It used to be its chief port. Much business is still done round the harbour. Most of the houses have view towers from which to look out to the splendid wide sea. It has been said that the best impression of Cadiz would be given by writing the word "white"

When Philip II. came to the throne of Spain, he succeeded to an empire which a Cæsar might have envied. It was, in fact, the first empire upon which the sun never set. But Philip was an incompetent bigot, and his policy led directly to the break up of this mighty empire. The break up began in his own reign by the successful revolt of the Netherlands, a revolt caused by the introduction of the Inquisition into that land. Here we see Philip in his palace at Madrid, accompanied by his priestly advisers, receiving a deputation from the Low Countries.

with a white pencil on blue paper—so blue are the sea and sky; so white the buildings! Nearly all the large cities of Spain lie on the coastal plains, on which two-thirds of the people of Spain live. Madrid is the chief exception, in which are about half a million inhabitants. Though Spain is larger than Great Britain, there are not half as many people in it.

The people of the Iberian Peninsula come of a very noble and dignified stock. Foreigners often consider them proud, but a great deal of their grand manner, especially amongst the peasants, is prompted by self-respect. The chief national amusement is the famous bull-fight, which is held in the chief cities at holiday times, and to which all the people go gaily dressed in their best, to watch the fighting of men with bulls. The animals are goaded and excited in every possible way, and great are the skill and daring of the toreadors. These men do part of their work on horseback, and it is terrible to think of the sufferings of the poor horses and bulls. The men, too, are sometimes badly hurt. It is a horrible and cruel thing, of which men and women ought to be ashamed, but, unhappily, other nations cannot say too much about the barbarity of it while they themselves hunt tame stags and shoot tame pheasants, and set dogs on to timid hares, and call it "sport."

While studying or drawing the map of the peninsula of contrasts, or modelling its rugged surface, there is much to think over and "see" with the inward eye. We know where to look for green valleys and ashy mountains, some tipped with snow; for the bright gardens of vines, olives, oranges, nuts, and the trackless wastes. And as we glance again round the long coast, what a pageant rises before us: of the Roman galleys, bringing soldiers and colonists; of the Moors pouring in near Gibraltar; of the little ships of Columbus sailing to the golden West, pilots of the rich treasure fleets—the "galleons of Spain" which Drake and others used to intercept.



The Alhambra, the magnificent home of the ancient Kings of Granada, has been described as a fairy palace out of the Arabian Nights, with walls as transparent as lace and veined like a leaf. It is surrounded by a mile of walls.

And then we see the gathering and sailing of the mighty Armada in all its glory, and from time to time through the centuries the bridal trains of princesses of the peninsula on their way to become Queens of England.

At Corunna is the grave of the gallant Sir John Moore, and Spanish earth holds many another hero of the Peninsular War. The great duke, who lived to fight many more campaigns, lies in St. Paul's Cathedral. Amongst his greatest victories are those whose names we can find in the Iberian Peninsula, for it is the hardest thing in the world to play a waiting game with really patient courage.

THE NEXT STORY OF COUNTRIES IS ON PAGE 3455

THE NOVELS OF THACKERAY

HAVING read the charming story of "Henry Esmond," we must now read its continuation in "The Virginians." Strictly speaking, the one story is not a "sequel" to the other, as that means a second story in which all the characters of the first reappear, and this is not the case in "The Virginians." Still, it is usually spoken of as a sequel to "Henry Esmond," as several famous characters in that story reappear in "The Virginians," together with their children and grandchildren. Although it is a fine and moving romance, it lacks something of the charm which we find in "Henry Esmond," as George and Harry Warrington, though both manly and lovable characters, have not the splendid qualities of their grandfather, Henry Esmond; while their mother has little of the charm of Lady Castlewood, whose daughter she was. The Castlewoods of the younger generation are also a contemptible set, but Beatrix is, perhaps, more sympathetic in her old age than she was as a young woman.

THE VIRGINIANS

THE STORY OF HENRY ESMOND'S DESCENDANTS

CONTINUED FROM 3270

COLONEL ESMOND had various reasons for leaving England at the close of the reign of Queen Anne. Having become so deeply involved in the Jacobite plots, which were designed to place the son of James II. on the English throne at the death of Queen Anne, but failed for reasons stated in "The History of Henry Esmond," he considered it wise to leave the Old Country. There was also the promise of a new and tranquil life for him in America, wedded to Lady Castlewood, whom he had loved so well and served so loyally. It will be remembered that we left them both happy in their new life in Virginia, where the colonial estates of the Viscount Castlewood, which were Esmond's by right, had been given to him by his stepson, the young viscount.

In the new Castlewood, as they had called their Virginian home in honour of the ancestral mansion in England, a daughter, Rachel, was born to the Esmonds, and she grew up a lively and energetic little woman, immensely proud of her parentage, as she had good reason to be. Like her mother before her, Rachel married at an early age, her husband being the younger son of a Norfolk baronet. His name was George Warrington. They were not fated to enjoy a long married life, and Rachel found herself a widow while still a young woman. She had, however, two sons, George and Harry, who were twins. As George was ushered into the world just half an hour before Harry, he was the heir to the estate; and Harry was taught from his earliest years to respect him as his elder brother. On the death of his dear wife, Colonel Esmond, now well advanced in years, gave over the management of his property to his daughter Rachel, who had shown the most remarkable capacity for the work, and whose business-like energy was known throughout Virginia. She was a little lady with a great belief in her own opinions, and having very rigid ideas of her importance as the daughter of such distinguished parents, she asserted herself to such an extent that, in time, she quarrelled with most of her neighbours as well as with her own sons. She even managed to fall out with her relatives in England by means of correspondence! Her husband had been dead but a short time when she gave out that she was to be known as "Madam Esmond," being prouder of her own name than of Warrington, although the latter was not without honour. And on the death of her father she recognised her son George as the heir of the estates, regarding him somewhat in the light of a young king for whom she was playing queen-regent.

When the boys were fourteen years old they were left a legacy of several thousand pounds by an aunt, and

the imperious Madam Esmond was greatly annoyed when the London lawyer would not recognise her claim to do with the money as she wished.

She would have kept it all for Harry, and because George sided with the lawyer in thinking it should be divided between them, she reproached him with his meanness, and decided she would save up for Harry's fortune.

THE WHIMS OF MADAM ESMOND AND THE BROTHERLY LOVE OF HER BOYS

Thus she went on through life: when she was "out" with one she was usually "in" with the other. It was a happy thing that none of their mother's whims affected the brotherly love of the two boys, who were devoted to each other. Harry was the stronger of the two, but as a boy George was quite as mischievous as his brother, and in a quarrel with a dull and prosy tutor named Ward, whom Madam Esmond admired and had appointed over the lads, George was so successful that the tutor had soon to leave, and Madam Esmond realised from that day there was a master, as well as a mistress, at Castlewood.

Later on, the young master of Castlewood proved that he had inherited something of his mother's hasty temper, when he challenged young Major Washington to a duel, in the belief that the major had made an offer of marriage to the fair mistress of Castlewood.

A gossiping lady companion of hers—Mrs. Mountain—who seemed to think that every bachelor gentleman who visited Castlewood was in love with Madam Esmond, had been responsible for the story, which was quite without truth. Thanks to Harry, who was a great admirer of the young George Washington, the matter was explained, and George apologised.

GEORGE WARRINGTON IS THOUGHT TO HAVE FALLEN IN BATTLE

The efforts of Great Britain to clear the French out of America were now about to be pushed forward with some determination. General Braddock, an officer of great distinction, was sent to the American colonies to organise the operations against the French. On his staff George Warrington became an officer, and so left home to take part in the fighting. Letters were regularly received from him at Castlewood, and read out by Harry to his mother and Mrs. Mountain; but one day came news of a terrible disaster that had overtaken Braddock's forces, and left the French and their Indian allies for the moment victorious. This news did not come from George, and, fearing he might be among the fallen, Harry set out for the front in the hope of discovering his brother's fate.

The death of Braddock left Dunbar in command of the forces, and to the camp of that commander Harry repaired, having heard that one of Braddock's officers was lying there ill with fever. He found, however, that this was not his brother, but his friend George Washington, now colonel, who could give him no good news of George, and believed him to have perished at the hands of the Indians.

Colonel Washington, on recovering, accompanied Harry back into Virginia, and had the pain of listening to the unreasoning reproaches of Madam Esmond, whose sorrow for the loss of her son, combined with her usual hasty temper, led her to accuse the colonel of having abandoned George to his fate.

WHY HARRY WARRINGTON LEFT VIRGINIA ON A VISIT TO OLD ENGLAND

As a consequence of this, life was gloomy and cheerless on the Virginian estate, and, to make matters worse, so far as Harry was concerned, the fever marked him out for a victim. When he was recovered sufficiently he was advised to go away on a sea voyage, and thus came the idea of his visiting the old land of England. Soon after he set sail for England, his mother left the plantation for her town house in Richmond, a thriving young colonial town, where she set up her little throne to continue her harmless amusement of playing the part of queen over the local colonial society.

It was in the summer of 1756 that Harry Warrington arrived in England, accompanied by his negro servant, Gumbo, and took coach from the port of Bristol to Castlewood House in Hampshire, the ancient home of his grandfather's family. Times had changed greatly at this old Castlewood. Harry's Uncle Frank, for whose sake Colonel Esmond had not asserted his undoubted right to the title and estates, was dead, and the new viscount had

One day the baroness showed Harry the portrait of a lovely young woman in the dress of Queen Anne's days, and said: "Harry, that was my face once, and then I was Beatrix Esmond, and your mother is my half-sister."

none of the nobility of his father's character. Indeed, there was nothing to admire in the new family circle at old Castlewood, drinking, gambling, and gossip-mongering occupying most of their time.

This, of course, was not known at first to Harry, who, calling at the mansion in the absence of the owners, was very coldly received by the servants. He left a note for my lord on his return, and betook himself to the village inn. The family returned soon after Harry's call, but when the Baroness Bernstein, the aunt of the viscount, arrived late at night, they had done nothing to welcome their Virginian cousin. Indignant at their ill-manners, she insisted that, unless one of her nephews repaired at once to the inn, late though the hour was, and invited Harry to Castlewood House, she would do so herself. Thus admonished, the viscount's younger brother, William, who, as was so common in those days, was fuddled with drink every night, set out for the inn, only to raise a quarrel there with Harry, who had gone to bed, and finally to be brought back in a wheelbarrow!

Early next morning the baroness made good the ill-manners of her nephews by sending a note to Harry inviting him to "Colonel Esmond's house in England," and when he arrived she presented him, with all her charming old courtesy, to his relatives. Harry immediately became a great favourite with her, and, later, when Gumbo had circulated exaggerated stories about the wealth of the Virginian estates now supposed to be Harry's property, the selfish, low-minded Castlewoods also began to take some interest in him.

One day the baroness, when talking with Harry, showed him the portrait of a lovely young woman in the dress which was worn in the time of Queen Anne, and she said to him: "Did your mother never tell you of another daughter her mother had in England before she married your grandfather?"

"She never spoke of one," he said.

"Nor your grandfather?"

"Never. But in picture-books for us children he used to draw a head very like that," said Harry, looking intently at the beautiful face in the portrait.

"And does the picture not remind you of anyone?" pursued the baroness, with a touch of sadness in her voice.

"No, indeed," said he.

"Harry, that was my face once, and then I was called Beatrix Esmond, and your mother is my half-sister, child, and she has never even mentioned my name!" she said very quietly.

BEATRIX GROWN OLD IS KIND TO HENRY ESMOND'S GRANDSON

The baroness was indeed the wayward Beatrix of long ago, who had caused much sorrow to her mother, and had fluttered the heart of Colonel Esmond. In her old age she had a melancholy pleasure in showing kindness to the grandson of those to whom her conduct had once given pain.

Harry's time was now passed in none too intellectual pursuits, for he soon fell into the habits of the house, playing at cards for money with his drunken cousin, Will, and Parson Sampson, the Castlewood chaplain, who resembled many of the clergy of his time in being more given to pleasure than to good work. He also found himself an object of particular interest to Lady Maria, Lord Castlewood's stepsister, who endeavoured to pass for twenty-seven, though her age was forty. Prompted by Gumbo's stories of Harry's wealth, this designing spinster had conceived the idea of becoming Mrs. Harry Warrington, and Harry innocently was in a fair way to encourage her in her scheme. But the baroness set herself to thwart the plans of Lady Maria for Harry's sake, and took every opportunity of letting him know the truth about that person.

HARRY BECOMES A "YOUNG MAN OF FASHION" AND IS IMPRISONED FOR DEBT

On his way to Tunbridge Wells, a fashionable place of resort at that time, a riding accident was the cause of his being carried to the house of Colonel Lambert, whose wife had been at school with Harry's mother, when Rachel Esmond had been sent to England for her education.

The home-life of the Lamberts was so wholesome and unaffected, compared with the low tone of the Castlewoods, that Harry felt as if he had passed into another world, and could have lingered indefinitely with them, enjoying the society of the colonel's daughters, Theo and Hester, for the former of whom he speedily conceived a tender regard. But he was bidden to join his relatives at Tunbridge, where his easy good-nature let him be led into ways that did him no credit. Among the gay gamblers he was soon a man of note, though many stories of his conduct were exaggerated; and when he moved to London to continue the life of a young man of fashion, he soon found himself in gaol for debt.

On news of this reaching the baroness she was ready to help, but meanwhile the artful Lady Maria had effected a little plan to win the heart of Harry by visiting him in prison, and bringing all the trinkets and jewels he had given her, in order to raise money for his release. His simple, honest heart was touched, and he now felt bound to Maria, so that when the baroness offered to pay all his debts on the condition that he would give up Lady Maria, he refused, and no doubt thought himself a very gallant gentleman in consequence.

GEORGE WARRINGTON COMES TO LIFE AGAIN AT AN OPPORTUNE MOMENT

Harry was still in prison when, one day, to the amazement of the baroness, "Mr. Warrington" was ushered into her room, and for a moment she was bewildered, as her visitor was extremely like Harry. He was none other than his twin brother George, who had not been killed, as was supposed, but, after a term of captivity, had been enabled to make his escape, and had now come to England in the nick of time to save Harry from a foolish step.

George was able to effect the release of his brother, although Colonel Lambert and Colonel Wolfe, good friends of Harry's whom he had treated none too well, were taking steps in the same direction before George's timely arrival. Freed from prison, Harry still foolishly persisted in his declared intention to marry Maria, and the baroness now determined to join forces with George in the hope of turning Harry from his purpose. After she had explained the trickery and hypocrisy of Lady Maria to him, George decided to put Maria to the test. By posing as the

selfish elder brother, he gave out that Harry, having squandered his own fortune, would receive no help from him, and would be dependent on the capricious favour of his mother for the future. This speedily altered the mind of Lady Maria, who had no wish to be Mrs. Harry Warrington in the absence of a fortune, and fortunately she herself took the step of freeing Harry from his promise to marry her.

HARRY FIGHTS AT QUEBEC WHILE GEORGE REMAINS IN ENGLAND

Depressed in spirits, and perhaps just a little jealous of the interest which Mistress Theo showed in his brother George, Harry joined a naval expedition as a gentleman volunteer. Later on, when his friend Wolfe had risen to the rank of general, and was in command of the British forces despatched against the French at Quebec, Harry was invited to become one of his officers, and was present at the great engagement when the gallant Wolfe met his death in the hour of victory.

Meanwhile, George had taken up the study of law in London, uniting with this a practical interest in literary pursuits. He wrote a successful play which the great Doctor Johnson was understood to have seen with approval on its performance. In fact, George was cutting something of a figure in the literary society of the time, and showed his good sense by falling completely in love with Mistress Theo Lambert, whom, in due course, he married, with the somewhat grudging approval of his mother.

Strangely enough, the Lady Maria also married for love, an actor who had performed in George Warrington's play having won her heart, and although the couple were extremely poor we are to believe they were not unhappy. Another and more important wedding, so far as our story is concerned, was that of Lord Castlewood with an American heiress, Miss Lydia Van den Busch, whose wealth did much to restore, outwardly at least, the fading grandeur of Castlewood.

GEORGE WARRINGTON NOW TELLS THE REST OF THE STORY

For the rest of our story we are supposed to read from the papers of George Warrington, whose delight in the literary art led him to put on record some of the more interesting episodes in his own career and the lives of his relatives.

In the year following the taking of Quebec, Colonel Lambert was appointed Governor-general of Jamaica, and was to proceed thither with his family. The day after we heard this news, Theo and I were privately married, lest we should be separated. My mother having written to me before news of my marriage could reach her, urging my return to Virginia, she was none too well pleased at my conduct in the matter, and showed no readiness to help me in the difficulties which I had now to face, through lack of funds, after discharging the debts incurred by Harry.

My hopes were for the time set upon a new play I was writing, but these were presently doomed to disappointment when the play was produced without success. Meanwhile, my Aunt Beatrix had died, leaving all her property, amounting to more than four thousand pounds, "to her dear nephew, Henry Esmond Warrington, of Castlewood in Virginia, in affectionate love and remembrance of the name which he bore."

GEORGE'S FORTUNES BRIGHTEN AND HE SUCCEEDS TO THE BARONETCY

This money I had forwarded to Virginia before I learned that my mother had ceased to send remittances to me; but the death of my young cousin, the son of Sir Miles Warrington, after whom my own son had been named, vastly changed my worldly prospects, and if for the time I felt the lack of means, I had the knowledge that my future was assured. Indeed, it was only in the following year that Sir Miles himself died, and I found myself Sir George Warrington, baronet, of Warrington Manor.

By this time, also, my brother Harry having seen fit to marry Fanny Mountain, the daughter of my mother's companion, the favour which my mother had been lavishing on Harry was again diverted in my direction, and after a time Madam Esmond so far softened towards my wife and myself as to invite us to visit her in Virginia. For some little while this was impossible, but when General Lambert returned from Jamaica, on the death of his wife, we left him in charge of Warrington Manor and set sail.

When we arrived at Madam Esmond's house, my mother met us at the door, and gave both of us her blessing as we

knelt before her. Conceiving a great liking for my dear wife, which was no surprise to me, my mother was presently so entirely amenable to Theo's advice and influence that she relented in her attitude towards my brother's wife, and received her in her house at Richmond.

GEORGE VISITS HIS MOTHER IN AMERICA AND SEES MORE FIGHTING

The political troubles which had long been brewing between the home Government and the American colonies were now at boiling point. For myself I remained loyal to the British Government, while Harry took the colonial side, though this in no wise weakened our brotherly relationship. When war broke out I saw some service under the British flag, but a wound received at the battle of Long Island proving slow of healing, I was led at length to return to my English home, where my elder children had been sent three years earlier.

Before leaving America, however, I had an opportunity of meeting Harry under a flag of truce, in the camp of General Clinton, with whom he was then serving, and the truest of friends and fondest of brothers came with me to the place of parting.

Before the war ended Harry had risen to the rank of general, and afterwards he visited us at Warrington Manor, soon after the death of his wife, whose good qualities he never ceased to praise. It was the fond wish of Theo and myself that he might some day marry Hester, and he did indeed venture at length to propose to her, but she declined to marry so long as her father lived.

I had but little intercourse with Lord Castlewood after I became the master of Warrington Manor, but that nobleman, thanks to the suggestion of his American father-in-law, laid claim to our Virginian estates on the ground that only a life interest in these had been granted by his father to Colonel Esmond, and that it was not intended they should have passed permanently from the possession of the Castlewoods. His brother William, who had been shot as a spy in America, had been there, I suspect, for the purpose of destroying the proofs of our absolute ownership to the Virginian estates.

At any rate, my mother discovered that the documents had been burned, but fortunately Parson Sampson, whom I met by happy chance, knew of a copy of the assignment which existed at Castlewood, and boldly going thither we got possession of this, and successfully confronted Lord Castlewood with proof of his dishonesty.

That nobleman had coolly offered to let us retain possession of the estates on payment of a greater sum than they were worth, thus showing his baseness. From that day I never again set foot in the historic home of my ancestors.

SIR GEORGE'S TRANQUIL LIFE AT WARRINGTON MANOR

At her house in Richmond, Madam Esmond still lives. Shall I ever see the old mother again? When Hal was in England we sent her pictures of both her sons, painted by the admirable Sir Joshua Reynolds.

We have copies of both of these paintings at Warrington Manor, but the picture which my son, Captain Miles, and the girls declare to be most like is a family sketch by my ingenious neighbour, Mr. Bunbury, who has drawn me and my lady with Gumbo following us, and written under the piece, "Sir George, My Lady, and their Master."

"Sir George, My Lady, and their Master."

Here my master comes; he has poked out all the house-fires, has looked to all the bolts, has ordered the whole male and female crew to their chambers, and begins to blow my candles out, and says, "Time, Sir George, to go to bed! Twelve o'clock!"

"Bless me! So indeed it is." And I close my book, and go to my rest, with a blessing on those now around me asleep.

The next stories of Famous Books are on 3473.

READING

SOME MORE ABOUT VERBS

CONTINUED FROM 3294

Now do you think you will always know a VERB when you see one? Verbs are among the most important words in the world, so we must always be very polite to them, pay them a good deal of attention, and never let them pass without noticing them. They are something like kings among words, because most of the other words are less important, and the verbs rule over them.

Now I want to ask you three questions, which you must answer.

1. What did you do yesterday?

WE PLAYED CRICKET.

2. What are you doing to-day?

WE ARE PLAYING BALL.

3. What are you going to do to-morrow?

WE SHALL PLAY TIP-CAT.

The first answer tells me something that you did yesterday; it is now PAST and gone, and you are no longer playing cricket. You have had supper, and been to bed, and had breakfast since. The second answer tells me what you are doing now at the PRESENT moment; you are so busy at playing ball that you can hardly stop to speak to me. And the third answer tells me what you are going to do to-morrow: you are looking forward to it, it is still in the FUTURE, and you are wishing that to-day would come to an end and to-morrow begin, so that you might start your game.

So you see there are three sorts of TIME: (1) The time that is gone, PAST time; (2) the time that is here now, this very second, PRESENT time; (3) the time that is coming, but has not yet come, FUTURE time. Every verb can be used in all these three ways. Let us try some more verbs and see.

If it was dinner-time, and you were busy eating your dinner, you could say: "I HAD a good breakfast this morning; I AM HAVING a good dinner now; I SHALL HAVE a good tea this evening."

And if a friend saw you in the street, but just as he was running up to you a big waggon came between you so that you could not see each other, you could say: "He SAW me just then; he SEES me not now; he WILL SEE me again in a minute."

Take any verb you like (such as WALK, LOVE, CALL) and try it for

yourselves; turn it into each one of these three times. But there is one more thing to remember; we do not talk about the TIMES of a verb, but about the TENSES of a verb. TENSE just means TIME, but it sounds more learned. And so you must call I RUN the present TENSE; I RAN, the past TENSE; and I WILL RUN, the future TENSE of the verb TO RUN.

Here are some verses about past, present, and future for you to learn:

Don't fret about the thing that's past,
And be no longer sad;
Your troubles cannot always last,
Nor times be always bad.

Don't waste your time and idly dream
About some future fight:
But like a man that rows up-stream,
Pull hard with all your might.

So do your duty here and now,
The present is your own;
And what you've done, and when and how,
The future will make known.

We have seen that there are different TIMES of doing a thing—Past, Present, Future: and so we have learned about the TENSES of a verb. I think that by this time you see quite clearly the difference between having learned your lessons already and intending to learn them at the last moment just before going to school. The one is PAST, the other is FUTURE; while if you are learning them now, that is PRESENT.

But there is another great difference that we all feel as we grow up, and that is the difference between doing something ourselves and having something done to us. Cruel boys like teasing cats and dogs, but they do not like to be teased themselves. It is very nice from our point of view to catch fish, but it is not very nice for the fish to be caught. Many of us enjoy kicking a foot-ball about, but if the foot-ball could feel, I do not suppose that it would enjoy being kicked.

Now, when a boy kicks a foot-ball, he says, "I KICK the ball," but if the foot-ball could speak, it would say, "I AM KICKED." And when the fisherman feels a fish on the end of his line, he can say, "I CATCH a fish," but the poor fish calls out to his father and mother, "Oh, dear, I AM CAUGHT." And if ever you pull poor Pussy's tail, you could say, "I PULL her tail," but she very likely says, "My tail IS PULLED by this naughty boy; I must scratch him to make him polite."

Do you see the difference? I KICK, I CATCH, I PULL, mean that the person is doing something; while I AM KICKED, I AM CAUGHT, MY TAIL IS PULLED, mean that the person or animal or thing is having something do..e to him or it. Here are some more sentences to think out:

The boy WHIPS his top.
The boy is WHIPPED by his father.
Baby NURSES her doll.
Baby is NURSED by her mother.
I PUT my toys on the shelf.
I AM PUT on the shelf by my big brother.

It is always quite easy to see the difference between these two kinds of sentences. Just ask yourself, "Is the person doing something, or having something done to him?" If he is doing something, then he is ACTIVE (which just means "doing"); if he is having something done to him, then he is suffering something, or, to use another word, he is PASSIVE (which just means "suffering"). So when we come across a verb that tells us the person is doing something, we say that this verb is in the ACTIVE VOICE; and when we come to a verb that tells us the person is suffering something or having something done to him, we say it is in the PASSIVE VOICE. The word VOICE is a very funny one to use here, isn't it? It generally means the tone in which a person speaks (as "This giant has a squeaky voice"), but we must remember that verbs have voices.

"There's all the difference in the world,
As clearly I can see,
Between doing a thing to somebody else
And having it done to me.
It's very great fun other people to tease,
Though sometimes it causes them pain;
But when they pay me back. all the jolliness flees,
I humbly beg pardon, go down on my knees,
And stammer, 'Oh, please, let me off this once, *please*,
And I never will do it again.'"

TOM AND NORA LEARN TO WRITE WITH INK

BEFORE the next writing lesson, Tom and Nora were taken by their mother to buy two little glass inkpots, two pens, and some blotting paper. Then they set about making pen-wipers from a piece of black cloth, cutting out four rounds for each, scalloping the edges, and sewing them together in the middle with pearl buttons.

"Now some nibs from the inkstand drawer, and we have everything ready for writing with pen and ink," said the children's mother. "You notice the inkpots are only three-quarters full, because ink is a nasty thing to spill for it stains so. In putting the pen into it, we take care not to dash the pen against the bottom of the pot, but just dip it in so that the ink covers the nib. Watch how I do it, and see how, when not using the pen, I rest it on the rim of the pot, so that the nib is out of the ink. Remember there is ink in the nib, and therefore the pen cannot be flourished about like a pencil."

Tom and Nora looked carefully at the pencilled copy their mother had already set, and then started to write each of the following words:

All Beck Can Dog Egg

Fat Get Hope Isle Jack

Kate Lift Meal Nail

While these words were being copied, the mother pointed out how, when it could be easily done, the capital letter joined on to the small letter to follow. For instance, A, C, E, H and J joined quite comfortably. D was more difficult, because it joined on to o in dog with a long curve, much longer than the one which ended the single capital letter. Nora turned up her old copies of D to compare the two.

H had also a long loop to make to get to the top of o, but then, as Tom said, H was quite ready for it, and did not do anything really new.

"G does not manage to join e at all," said Tom, as he looked at the word Get.

"When you can write quite fast, you will want to join every letter," said his mother. "But that will not do yet, for we have to walk before we can run."

Tom wanted very much to find a way to make G join on, and he tried several ways on a piece of scribbling paper; but every one looked so ugly or awkward that at last his mother came to his assistance.

"Do you remember," she said, "there is another way of making capital G? This is it, and Tom will have no difficulty in joining this G to e. You see it has a tail like small g, and ioins on like it."

Gg

Nora had noticed that she and Tom were writing the capitals in the order of the alphabet, so she was not surprised when the first of the new words to be written was Kate, the name of the nursemaid.

K, L, M and N were quite easy to join, and Tom and Nora had worked so hard with their new pens, and only made one smudge between them, that their mother said they should rest and watch her make M and N in another way, as she had once promised. This is how she wrote these letters:

M N

"This way of making M and N is not so common as the way you already know, and the letters are unlike small m and n," she remarked.

HOW NUMBERS ARE DIVIDED

SUPPOSE we have 28 marbles, which we wish to divide amongst 7 boys. How many marbles shall we be able to give to each boy?

Clearly, if we give each boy one marble, we use 7 of the marbles. If we give each boy a second marble, we use another 7, which makes *two* sevens. We see, then, that the number of marbles each boy will get simply depends on *the number of sevens in* 28. Now, our multiplication table tells us that *four* sevens make 28. Thus each boy will have 4 marbles.

Now, this process of dividing 28 marbles amongst 7 boys is evidently the same thing as finding out how many times we can take away 7 from 28. Thus, division is repeated subtraction.

We must next notice that, if we had been told that 28 marbles are divided amongst a certain number of boys, and each boy got 4 marbles, then we can find out the number of boys. For we have only to think how many 4's make 28. We know that *seven* 4's make 28, so there must be 7 boys.

Either of the results we have just obtained could be got by actually counting out the 28 marbles. We used the multiplication table, but the table itself was formed by counting. In a similar way, we will now try to divide 52 pencils into 4 equal groups.

Suppose we have the pencils arranged in tens. There will be 5 tens, and 2 odd pencils. Now, to divide these into 4 groups, we can begin putting one of the tens into each group. This will leave us with a bundle of ten and the two odd pencils. If we separate this remaining bundle, we shall have twelve loose pencils. We have now only to count out these pencils into the four groups: we use 4 every time we put a pencil to each group, and since there are *three* 4's in the 12 pencils, we shall be able to put 3 more pencils to each group. Each group now consists of a bundle of ten, and three odd pencils—that is, 13 pencils, or 52 divided by 4 gives 13.

We have divided 28 into 4 equal parts, and 52 into 4 equal parts. Let us now examine the process carefully.

In the case of the 52 pencils we had 5 bundles of 10—that is, there were *more* tens than the number of groups. We were therefore able to put a ten into each group, *without breaking the bundles*. Having done this, we had not enough bundles left to put another into each group, so we had to break the remaining bundle and proceed to deal *ones* into each group.

In the case of the 28 marbles there were not enough tens for us to begin by putting a ten into each group. We had, therefore, to begin at once dealing *ones* into each group.

This same idea has to be carried out in the division of any other number. Suppose the number 956 is to be divided by 4. We first divide the hundreds into 4 groups. The number contains 9 hundreds; we can therefore put 2 hundreds into each group. We now have 1 hundred left over. This hundred consists, we know, of 10 tens. Putting these with the other 5 tens, we have 15 tens altogether. We next proceed to divide these tens amongst the 4 groups. There will be 3 tens for each group, and 3 other tens will be left over. Finally, we take these 3 remaining tens and separate them into thirty units. These, with the 6 units of our number 956, make 36 units altogether. Then, dividing 36 units into 4 groups, we get 9 units for each group. Thus, each group now contains 2 hundreds, 3 tens, 9 units—that is, 956 divided by 4 gives 239.

To do our work on paper, we shall arrange it like this. Write the 4, which is called the *divisor*, in front of the number to be divided, 956 (this number is called the *dividend*), and separate it from the 956 by a bracket. Then say, 4 into 9, **2**, and 1 over. Put down 2 in the hundred's place—that is, under the 9.

$$\begin{array}{r} 4)\overline{956} \\ 239 \end{array}$$

Remember that the "1 over" is 1 hundred, and we have only to put this 1 before the 5 to know that there are now 15 tens. Next, say 4 into 15, **3**, and 3 over. Put down 3 under the 5. The "3 over" are 3 tens, which, written before the 6 units, make 36 units. Finally, 4 into 36, **9**. Put 9 under the 6.

ANSWERS TO EXAMPLES ON PAGE 3291.
(1) 862. (2) 1. (3) 1340. (4) 1462. (5) 18.

TWO NEW GAMES OF THE FAIRIES

WE have already discovered that there are a great many things to learn before we can get the piano fairies to tell us all their beautiful stories.

We have been playing the game called "The Sleepy Arm," have we not? The fairies look very pleased when they see our arms getting quite loose, because they know we are starting on the right way, and they will be able to make known to us their lovely secrets. So we must go on every day playing this particular game, for in fairyland, as in every other land, we learn and know that "practice makes perfect."

The fairies tell us three things. They tell us that we shall have to use (1) our arms, (2) our hands, and (3) our fingers; but we must get them into such good working order that we have not to think about them, because we shall want all our mind, all our ears, yes, every bit of our intelligence, *to think the lovely sounds* we want to hear.

When we are walking or running we think of the place to which we want to go, do we not? We do not keep worrying about the way we should put our feet on the ground. We have done it so often that the movement has become automatic—that is, the feet seem to move entirely of their own accord. That is just what must happen with our arms, our hands, our fingers. We must exercise them so well that at last we shall feel they are just doing what we want, *without any effort*, without any trouble.

To-day the fairies send us two new games of play. In the first one we go to the table, *not* the piano. We must sit down just as we do when we are playing the piano, extend our hand about three inches above the table, then, quite slowly, we shut the hand, just as if we were gathering up sweets, and as our fingers thus sweep towards the palm of our hand, we shall slightly raise the wrist joint; then we will let the hand bound back again to its first position.

Our second game takes us to the piano. We let the soft little pad of our middle finger just touch Fairy C's note. We must only touch it very lightly, because we do not want to put the note down; we just want to rest on its surface. So, keeping our finger just in the middle of the note, we are to move our wrist slightly up and then down again, about an inch each way. This game is called the "Fairies' See-saw," and the great thing to remember is that we must *keep our arm quite loose;* there must never be the slightest stiffness.

These are the games the fairies want us to play with each hand alternately—that is, first one and then the other—for quite ten or twelve lessons, for everything we are doing is important.

One day a little girl said to her mother:

"It seems stupid to have to take so much trouble, because clever people do everything quickly."

She was a funny girl to have such a queer idea, was she not? Perhaps we can guess the fairies' answer to such a thought. They told her a little story, and now they are whispering it to us.

Once upon a time there was a little boy named *Felix Mendelssohn Bartholdy*; in the nowadays he is always called *Mendelssohn*. The pianoforte fairies were very fond of him, and he was devoted to them. He knew how much they had to tell him, and he worked hard to find out all they wanted him to know.

The days did not seem long enough for all he had to do, and he used to get up early so that no moments should be lost. If you and I had been in his home in Berlin, we should have found him hard at work at five o'clock in the morning. He took one holiday in the week, and that was on Sunday, which he very much enjoyed. Yet, though he worked so hard, he was very far from being stupid. He played at a big concert when he was only nine years old, and by the time he had reached eleven years of age, he had written quite a lot of music for himself and for all music lovers. If ever we go to the Royal Library in Berlin we shall be able to see some of his manuscripts, and I think we shall find how very neat they are, because Mendelssohn took great pains over everything he did. He grew up, became a great artist, and went on writing beautiful music for you and for me to know and to love.

MAKING SIMPLE PATTERNS WITH FLOWERS

IN making patterns, when we get our idea from flowers or leaves, we always have to leave out some of the details because they confuse the eye, and very fine work is only suitable for patterns seen quite close and where very rich ornament is necessary. Simple designs and simple colours are the most successful, and until we can draw very beautifully, we must not attempt anything elaborate.

The best way to get a good idea of the shape of the flower is to brush-work it in *neutral* tint—that is, to mix some brown, grey, or even black paint, and make the best copy we can of all the parts of the flowers.

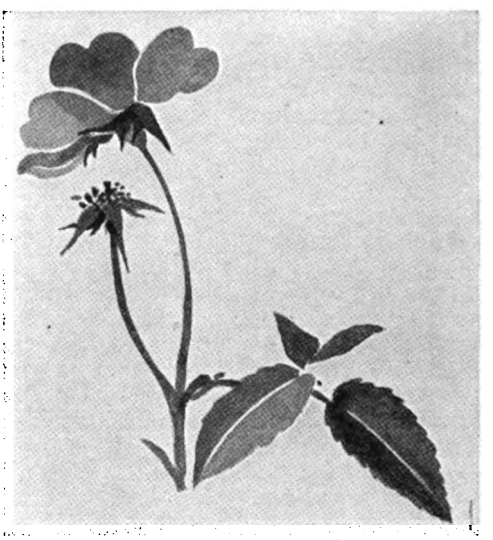
Seed-vessels and bud of the rose

We will choose to-day some flower or leaf—any flower will do—but one with five petals is best, because it is so useful for decorating all sorts of spaces.

English children love the rose specially because it is England's favourite flower. It has been painted on shields, carved on the ceilings of churches and palaces, and it was worn as a badge by the Houses of York and Lancaster, so that it gave its name to the Wars of the Roses.

We hear often of the golden lilies of France, and, years before either the Britons or the French people existed, the Egyptians used the lotus flower for decorating their temples, their pottery, and their clothes. But these flowers are used in their very simplest forms; the delicate stamens and cut-leaf edges of the rose are not suitable for wood and stone-carvings, and the great secret of good designs is to suit the decoration to the material it is worked in.

Boys and girls who can carve and embroider can begin to make patterns for themselves now, and we will see what we can invent with a rose or any other flower as patterns, one for carving, and another for needlework. Suppose we have a frame to carve, we must have a pattern running all round, as the rose stem suits this style. We must have bold work, and we want contrast in all designs. The rose and its leaves will give us this. Of course, we are not going to copy the illustrations here, but invent for ourselves.

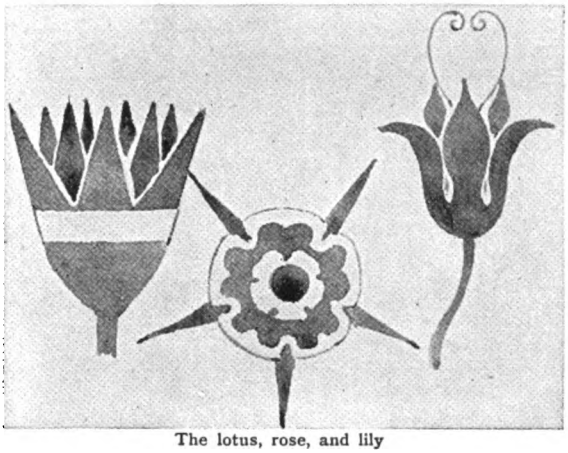


The rose drawn in neutral tint from nature

For embroidery, we can have finer work. It can be worked in silks or fine linen, and these are delicate materials and need delicate designs. We can go a little closer to the rose for this, and have the pleasure of copying the colours too, but must not try to put all the colours in. This would mean failure. Besides, we are not copying the rose itself, only making a pretty suitable pattern for our work out of ideas the rose

has given us, so we shall not attempt to give all the stamens or the veining of the leaves, but make our pattern flat and simple.

When we have sketched out the idea we can draw one corner very nicely, and use tracing paper for the other corners. Tracing paper can always be used in designing when we want to repeat exactly what we have already drawn; but we must be very careful to fit the edges of the pattern together.



The lotus, rose, and lily

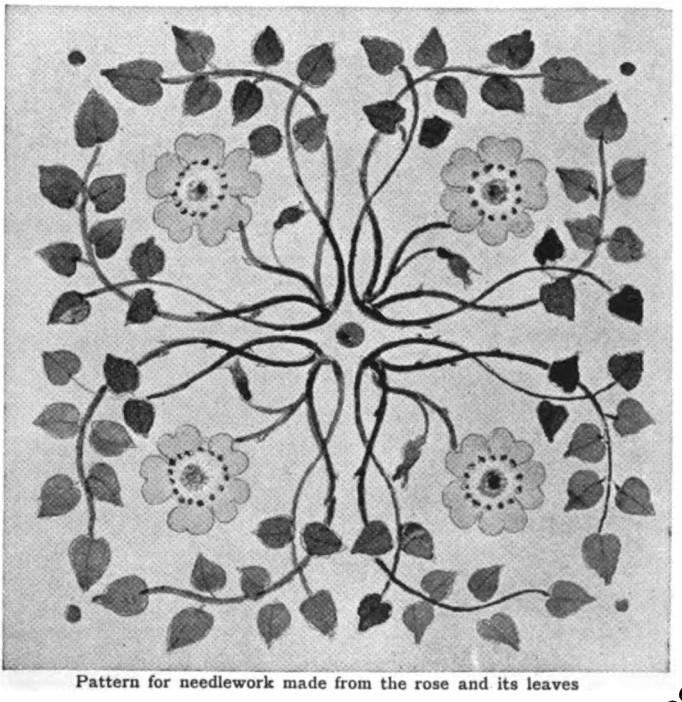
There is a paper called transfer paper which can be bought in three colours—red, blue, and black. When the drawing is finished, this is placed between it and the material, and the pattern traced with a blunt-pointed pencil or other instrument. Blue or black is best for wood, red for light-coloured stuffs. There is also sold a white tracing cloth, which is useful for dark, smooth materials.

The cornflower is another very useful flower for designing, the thistle and the oak leaves are very suitable for carving, and we shall find it a help to model our designs in clay before we begin to carve them.

We can make covers for our sketch-books and blotters and other books, by painting on different coloured linens. For this, the designs look best all in one or two colours, with a strong dark outline. If we want the pattern lighter than the background, we must use *Chinese White*. We can paint all the patterns white first, and afterwards, when it is quite dry, paint over it; or we can mix the colour first, taking care to mix enough.

The rose drawn boldly for carving

In most of our hobbies we find the need for patterns, and if we can paint our own designs, the pleasure in our work will be increased.



Pattern for needlework made from the rose and its leaves

LITTLE PICTURE-STORIES IN FRENCH

First line: French. Second line: English words. Third line: As we say it in English

Hier nos cousins ont donné une fête. Jeannette et moi nous étions invités.
Yesterday our cousins have given a fête. Jenny and I we were invited.
Yesterday our cousins gave a party. Jenny and I were invited.

Jeannette portait une robe de soie, et des souliers blancs. Elle était très belle.
Jenny carried a robe of silk, and some shoes white. She was very fine.
Jenny wore a silk frock and white shoes. She was very fine.

Nous sommes arrivés à la maison. Elle était illuminée du haut en bas.
We are arrived at the house. It was illuminated from the top in the bottom.
We arrived at the house. It was lit up from top to bottom.



Dans le salon nous avons trouvé quelqu'un que nous avons reconnu.
In the drawing-room we have found someone whom we have known.
In the drawing-room we found someone whom we knew.

C'était Annette. Je l'ai invitée à danser. Elle a mis la main dans la mienne.
This was Annette. I her have invited for to dance. She has put the hand into the mine.
It was Annette. I asked her to dance. She put her hand in mine.

La salle était decorée de fleurs. Ma cousine a donné une rose à Jeannette.
The room was decorated with flowers. My cousin has given a rose to Jenny.
The room was decorated with flowers. My cousin gave Jenny a rose.

A neuf heures nous sommes descendus pour le souper. J'avais faim.
At nine hours we are descended for the supper. I had hunger.
At nine o'clock we went down to supper. I was hungry.



Les fraises étaient très bonnes, mais j'aime mieux les glaces.
The strawberries were very good, but I like best the ices.
The strawberries were very good, but I like ices best.

Nous avons dansé le "Sir Roger de Coverley." Puis le bal était fini.
We have danced the "Sir Roger of Coverley." Then the ball was finished.
We danced "Sir Roger de Coverley." Then the ball was over.

Nous avons dit: "Bon soir," et nous sommes allés en voiture à la maison.
We have said: "Good evening," and we are gone in carriage to the house
We said: "Good-night," and drove home.

THE NEXT SCHOOL LESSONS BEGIN ON PAGE 3423